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MIGHTY *Midget*

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BUSINESS AND OFFICE PRODUCTIVITY TOOLS

MONEY MANAGER

Understanding business ratios

TECH PERSPECTIVE

Factors affecting surface prep

READER PIPELINES

Making the most of GPS

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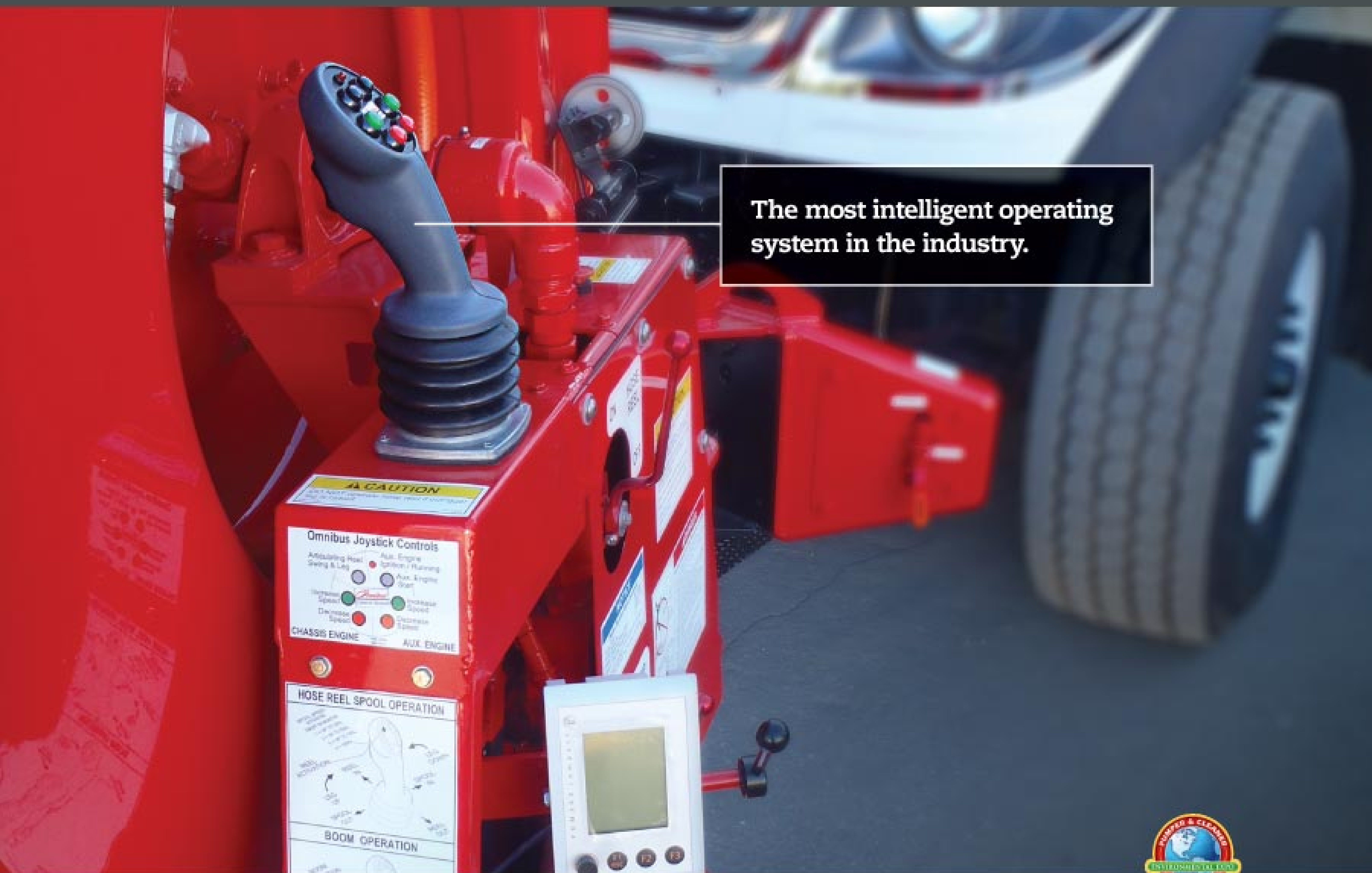
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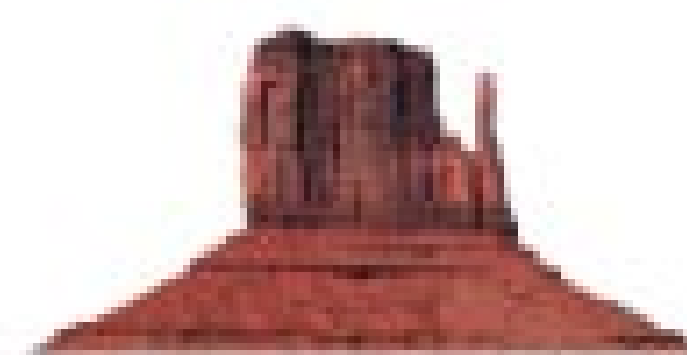


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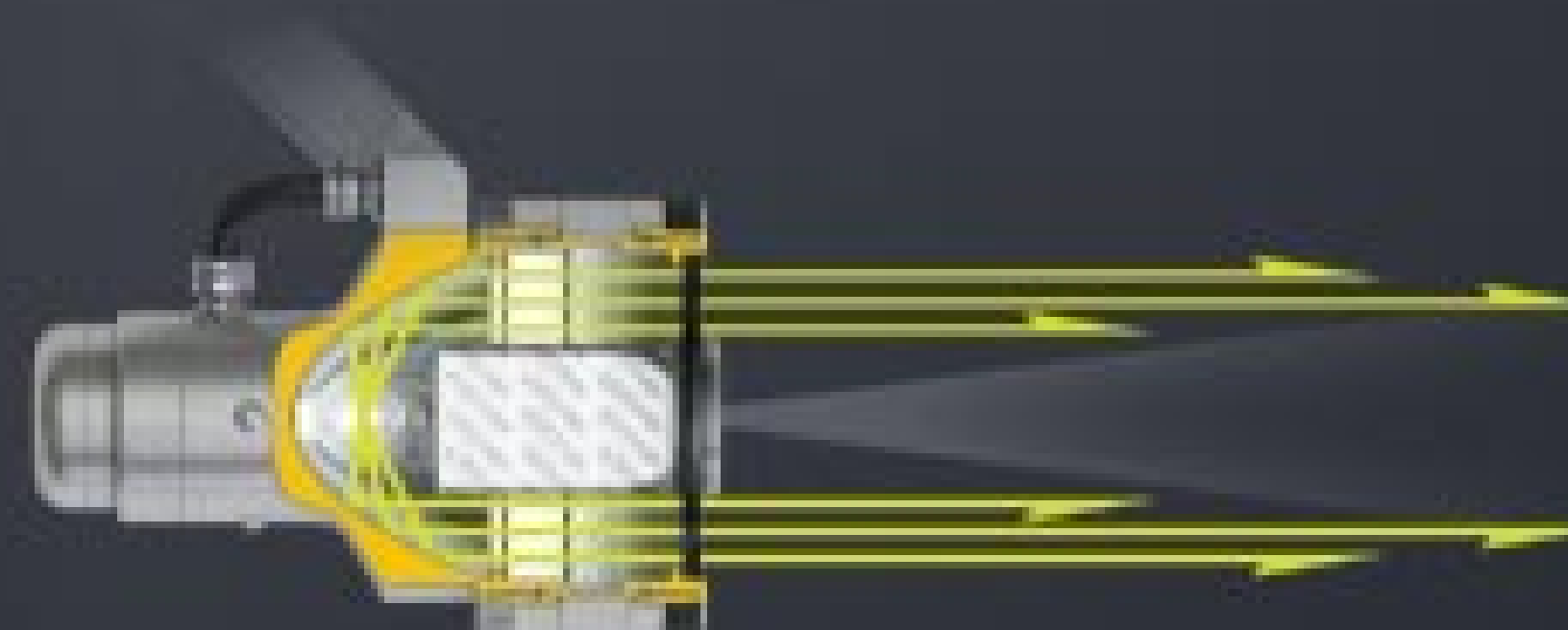
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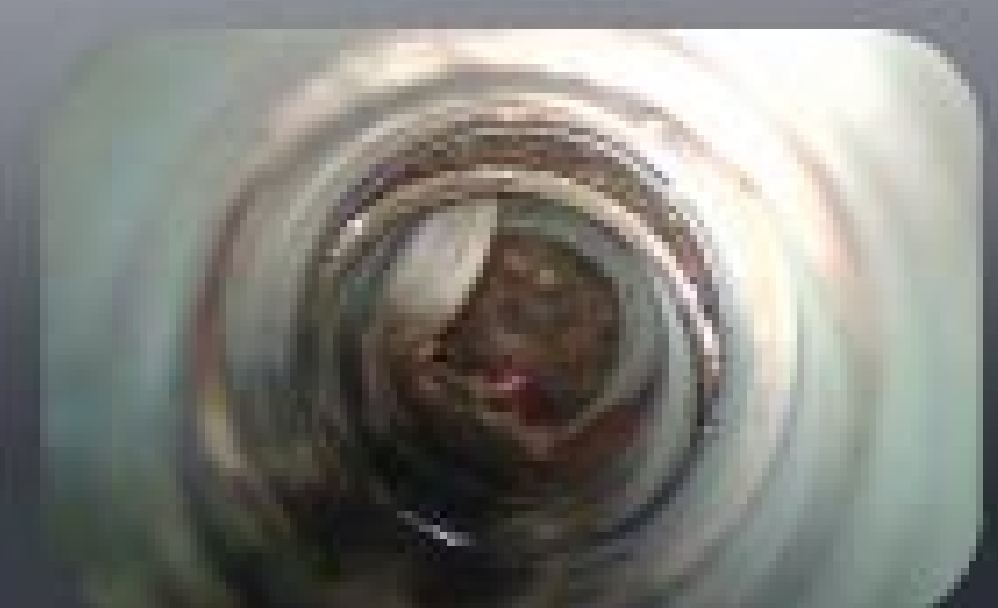
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On the cover: Mori-Is Tested in Yorba Linda, Calif., is a small company that has forged ahead boldly with a wide menu of services, including specialties in cured-in-place pipe lining and inspection of sewer laterals from the main. Here, crew members Andrew Rasmussen and Jorge Silva prepare to deploy an OZil camera and Mudmaster transporter from CUES. (Photography by Dean Thomas)

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- Money Manager: Armoring yourself with complete insurance coverage
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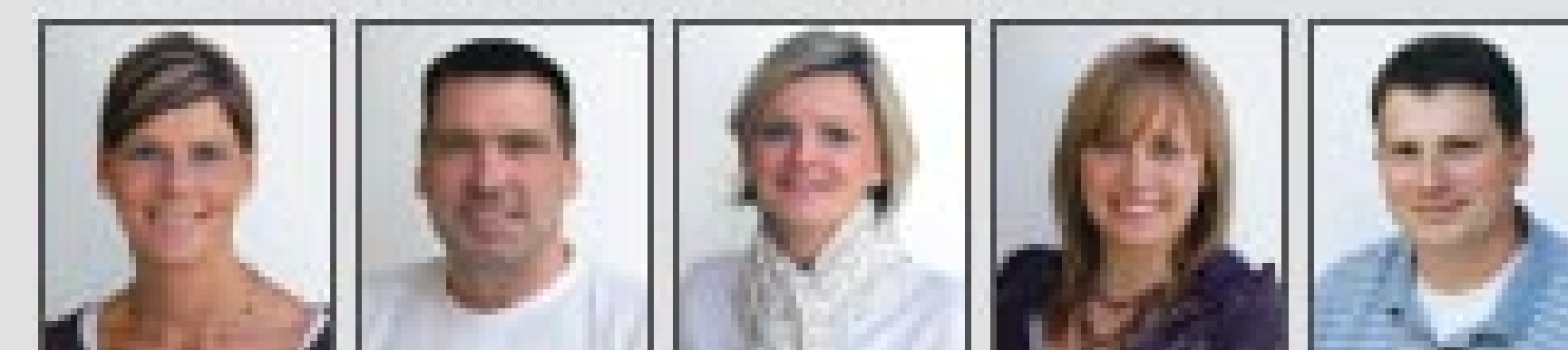
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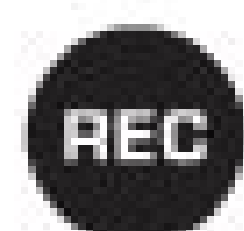
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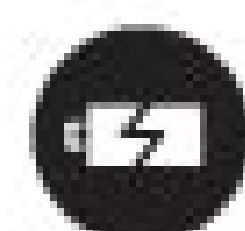
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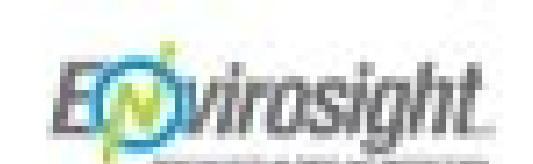
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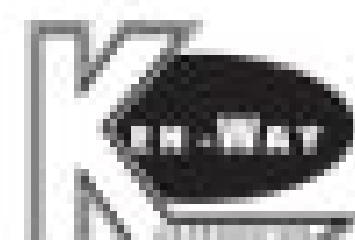
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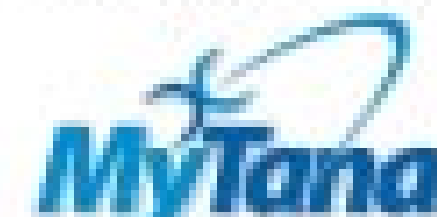
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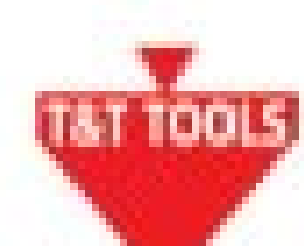
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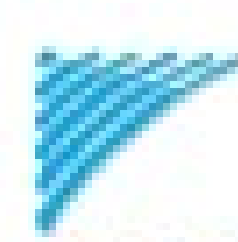
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Ted J. Rusoff

King Arthur had his Knights of the Round Table. The life insurance industry has its Million Dollar Roundtable.

And now you can join an industry Roundtable during the 31st Annual Pumper & Cleaner Environmental Expo in Louisville March 2-5. On Saturday, March 5, COLE Publishing will hold a Roundtable Discussion and Pancake Breakfast from 8 to 10 a.m. It's a chance to spend time with professionals in the pipe and drain maintenance and other environmental service industries and share ideas and best practices as they relate to pressing issues facing service businesses.

PART OF THE NETWORK

A big reason to attend the Expo (or any industry trade show) is to network with your peers from around the country. The Roundtable event is designed to bring a tighter focus to networking by putting you in a group with others who have concerns and questions similar to yours.

Choose your group carefully and you're likely to come away with a couple of profit-boosting ideas, or a solution to a persistent problem, or an approach

that can help you run your business and lead your people more effectively.

The beauty of a trade show is that you get to talk with others in the business who are *not your competitors*, and so are willing to share ideas freely. You are unlikely to experience that kind of sharing back home.

HERE'S HOW IT WORKS

We've set up this event to maximize sharing. While you'll be asked to select just one Roundtable group in which to take part, each group will report to the entire room at the end of the discussion, so you get insights on a variety of important issues.

The beauty of a trade show is that you get to talk with others in the business who are *not your competitors*, and so are willing to share ideas freely. You are unlikely to experience that kind of sharing back home.

We'll start by selecting, by show of hands, several topics for discussion. Then we'll devote a group of tables to each topic and ask those present to choose the topic of greatest interest and go to that area of the room.

After around-the-table introduction of group members, each group will select a leader who will guide the discussion, record comments on the flip chart, and give the report at the end of the session.

The discussion will be free-flowing, with just a few basic ground rules, such as: no criticizing of anyone's ideas, keep comments short and concise, stay on topic, and give everyone a chance to speak.

The discussion will last about 30 minutes, after which each group will summarize the items discussed and decide what to present to the larger audience. Each group leader will then have about five minutes to give a report.

GET INVOLVED

That's the basic format – we'll provide all the instructions and materials to make the experience easy for everyone. In return, here's what we ask of you:

1. **Register.** To help us plan for the event and set up the room, we need participants to register in advance. Go to www.pumpershow.com/roundtable.
2. **Suggest a topic for discussion.** We'll be looking for discussion topics from now until the start of the Expo on March 2. We will consider all ideas carefully before selecting those to present to the group. Suggest your topic at the Web address above.

3. **Come to the event ready to learn and share.** The more focused the group members are, the more everyone will get out of this event.

The breakfast price is \$10 and includes fresh fruit salad, buttermilk and blueberry pancakes, link sausage, maple syrup and butter, orange juice and coffee. I'll be the master of ceremonies for the Roundtable, and I look forward to seeing you there. ☺





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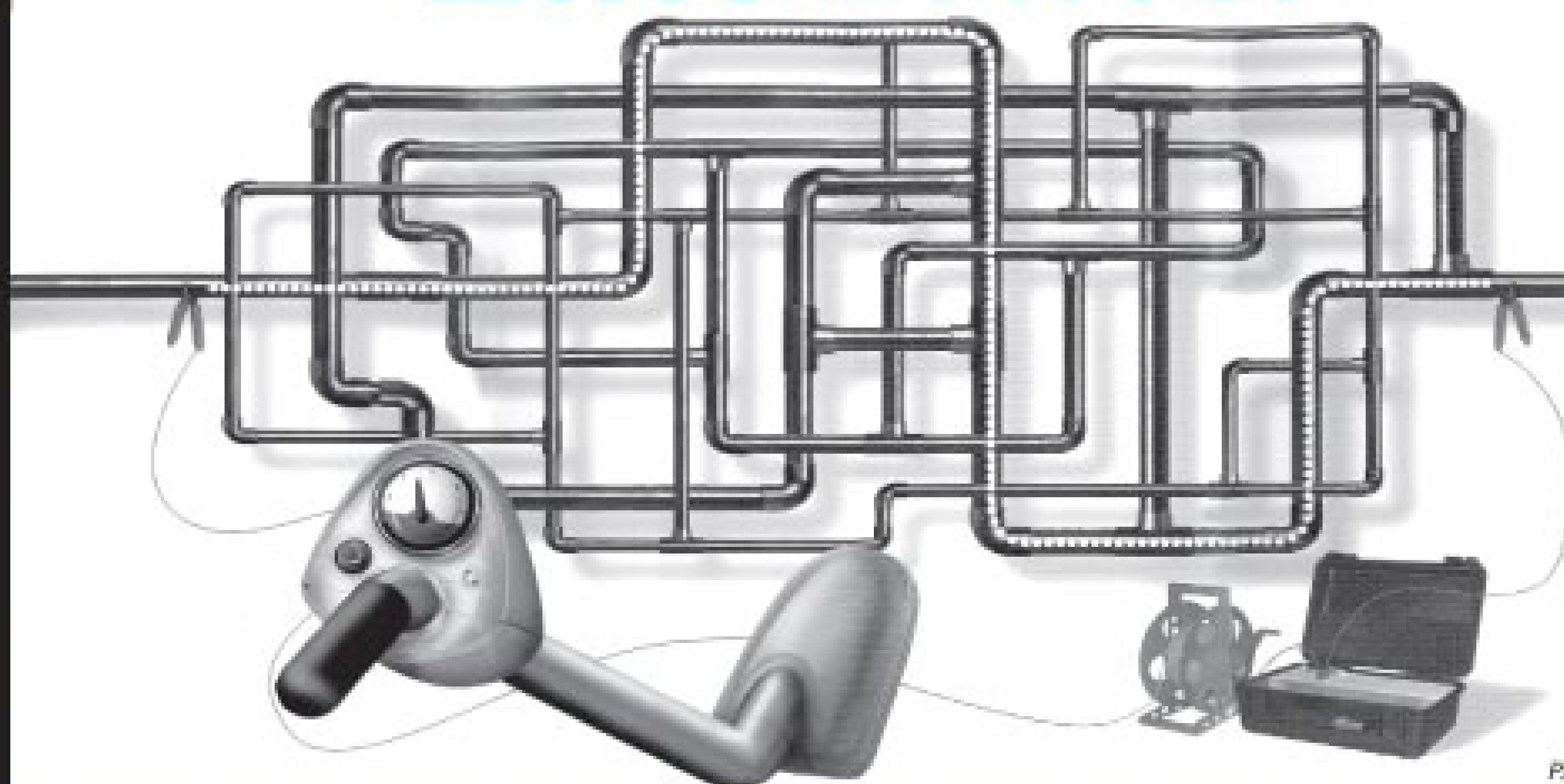


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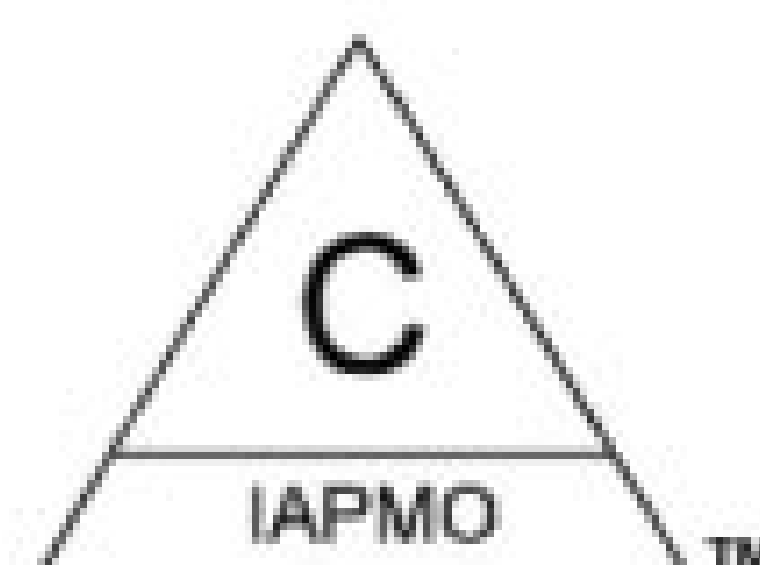
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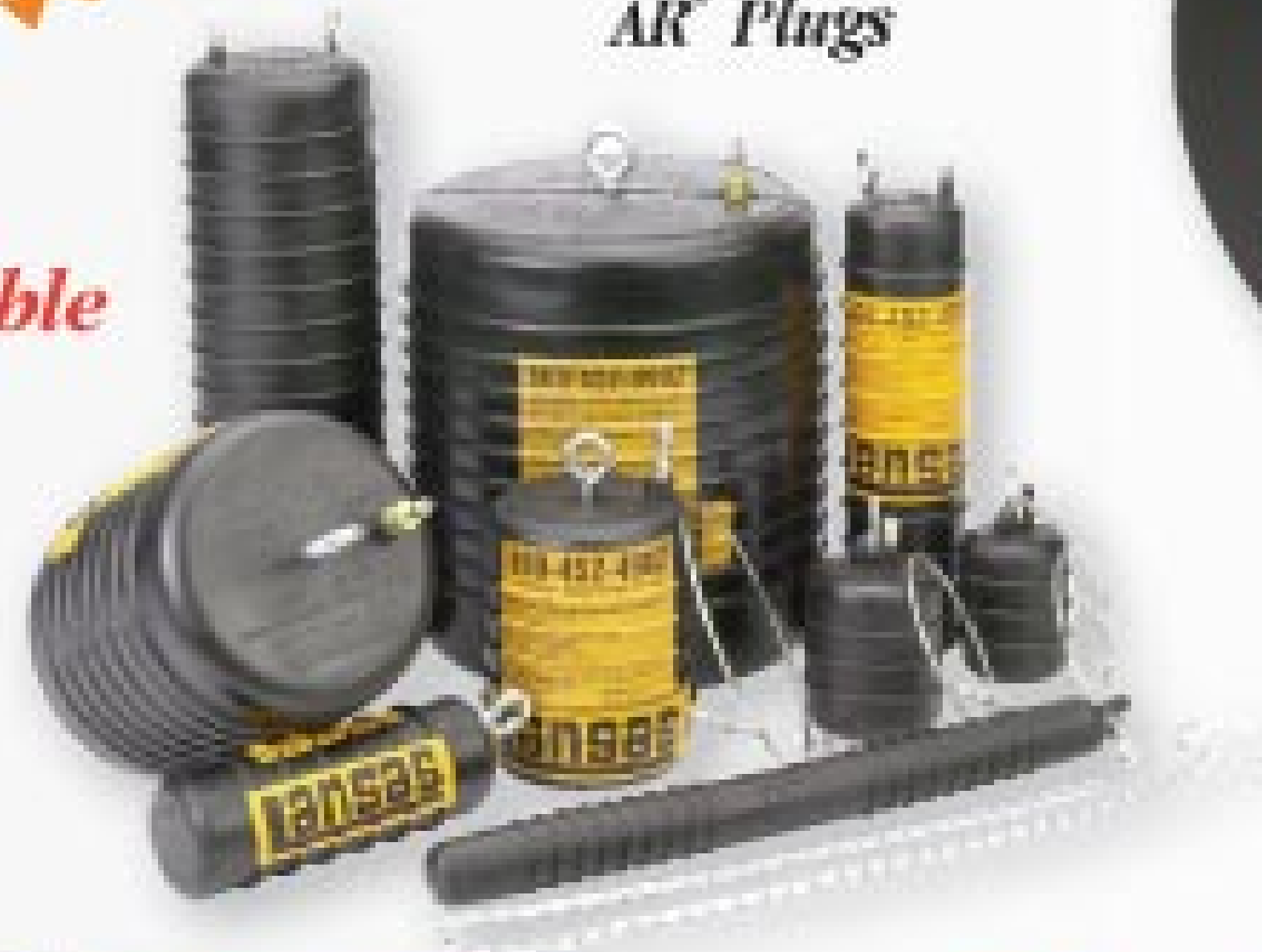
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CPR Revisited

THE AMERICAN HEART ASSOCIATION HAS RELEASED NEW GUIDELINES FOR HELPING TO RESUSCITATE VICTIMS OF SUDDEN CARDIAC ARREST

BY TED J. RULSEH

Do you or any of your people know CPR? Has anyone in your organization been trained and certified? If not, maybe CPR training would be a good investment, because you never know when someone on your team, or someone your people encounter in the field, will be stricken with sudden cardiac arrest.

Even if you have been certified, a refresher course may be in order. That's because the American Heart Association has revised its CPR guidelines as of 2010. The new guidelines are based on international scientific evidence involving hundreds of experts who reviewed thousands of peer-reviewed papers on the subject.

KNOWING THE BENEFITS

CPR (cardiopulmonary resuscitation) combines rescue breathing and chest compressions to help victims thought to be in cardiac arrest, in which the heart stops pumping blood. CPR can support a small amount of blood flow to the heart and brain to buy time until the person gets professional care to restore normal heart function.

The association reports that fewer than one-third of people who suffer cardiac arrest outside a hospital receive CPR from a bystander – yet effective bystander CPR, immediately following cardiac arrest, can double or triple a victim's chance of survival.

How effective is it? While there are no reliable national statistics, a variety of studies show that early CPR has benefits, especially if followed by defibrillation to shock the heart back into a normal rhythm.

The Heart Association says that early CPR and defibrillation within three to five minutes of a person's collapse, plus early advanced care, can mean greater

than 50 percent long-term survival. Early CPR from bystanders is less helpful if emergency medical personnel with a defibrillator arrive later than eight to 12 minutes after collapse.

The association reports that fewer than one-third of people who suffer cardiac arrest outside a hospital receive CPR from a bystander – yet effective bystander CPR, immediately following cardiac arrest, can double or triple a victim's chance of survival. The association trains more than 12 million people in CPR each year including health care professionals and members of the general public.

DOING IT RIGHT

Of course, to be effective, CPR has to be done right. The new Heart Association guidelines include some fairly substantial changes in approach and technique.

Perhaps most significant is a change in sequence from the traditional A-B-C (airway, breathing, chest compression) to C-A-B (chest compression, airway, breathing) for adults, children and infants.

The association says that while this fundamental change in sequence will

require re-education of everyone who has ever learned CPR, the benefits will justify the effort. The thought behind the change is that in the A-B-C sequence, chest compressions are delayed while the responder opens the airway to give mouth-to-mouth breaths.


In the C-A-B sequence, chest compressions are started immediately and 30 compressions are given before mouth-to-mouth breathing is started. This establishes some limited blood flow, and the delay in ventilation is minimal. Among other changes:

The chest compression rate should be *at least* 100 per minute, rather than *approximately* 100 per minute.

The chest compression depth for adults should be at least two inches, rather than one-and-a-half to two inches.

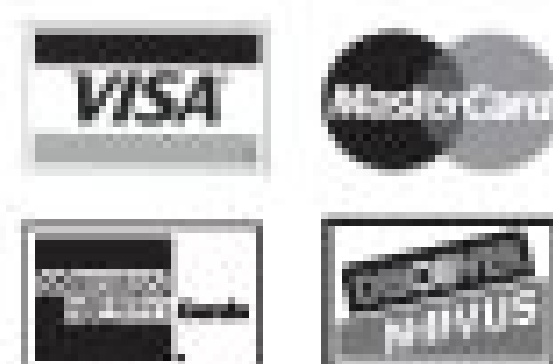
FIND OUT ALL THE FACTS

A note of caution: *Please don't rely on this quick summary* for instruction in the latest CPR methods. You can find complete information by visiting www.heart.org and clicking on the "CPR & ECC" tab. In addition, you should get formal training (or consider updating the training you have) before attempting these techniques on anyone.

Having someone on your team certified in CPR can literally be a life-saver. If your business is not in that position, perhaps now is the time to consider CPR training. 

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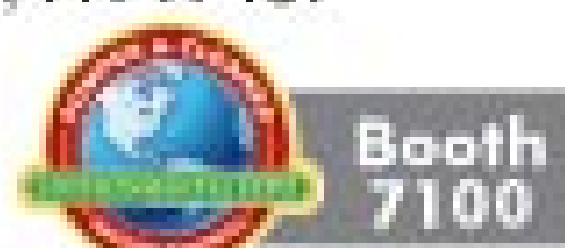


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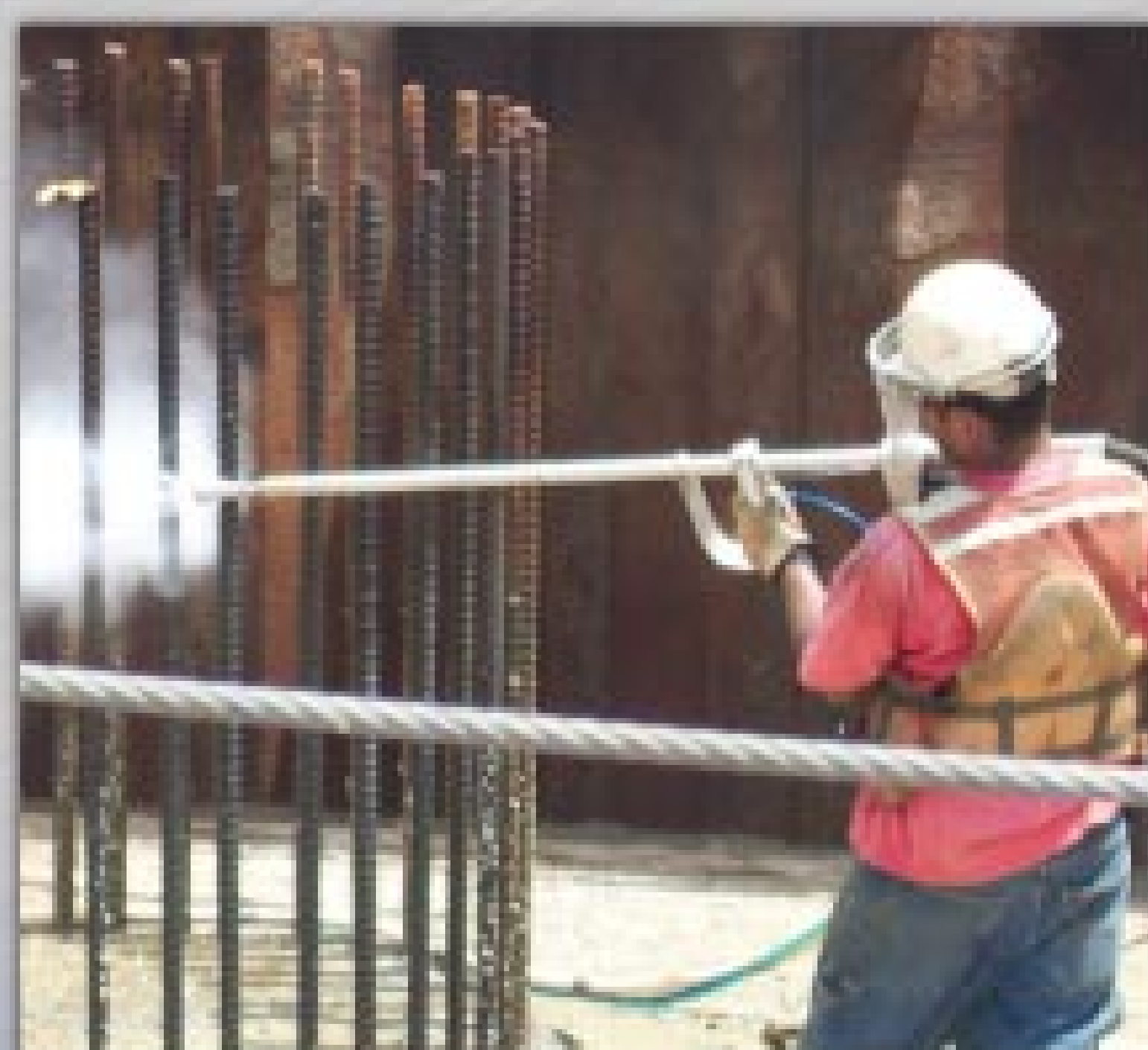
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Plumbers Steve Glenn (left), Chris Lyon (center) and Rick Brown use a Harben trailer-mounted waterjetter to clean a sewer main. (Photography by Tracey Washburn)

Continuing EDUCATION

CONSTANT LEARNING HELPS A NORTH CAROLINA DRAIN CLEANER RUN A PROFITABLE BUSINESS AND DEVELOP HIGHLY CAPABLE FIELD TECHNICIANS

BY KEN WYSOCKY

Think of Steve Harmon as MacGyver with a drain-cleaning machine instead of, say, a paper clip and duct tape. Like MacGyver, the TV secret agent and troubleshooter, Harmon thrives on a challenge – jobs that stump others or that they won't even tackle.

He credits great mentors and ongoing education for giving him the skills and confidence to handle those jobs. "I don't like the jobs that are cut-and-dried," says Harmon, owner of Harmon Plumbing Services, which does business as a Rooter-Man (A Corp) franchise in Raleigh, N.C.

"I like the ones that force me to use everything I've learned. You should never stop learning. If you do, there's something wrong. I know guys who are 65 and 70 years old who still take classes."

THE RIGHT MENTORS

Harmon started his professional education around 1983, when his future father-in-law, a master plumber, suggested he give plumbing a try. Harmon was

profile

HARMON PLUMBING SERVICES INC., DBA ROOTER-MAN, RALEIGH, N.C.

OWNERS:	Steve and Karen Harmon
FOUNDED:	1989
EMPLOYEES:	5
SERVICE AREA:	30-mile radius around Raleigh-Durham
SPECIALTIES:	Drain cleaning, inspecting and troubleshooting

21 at the time, and growing weary of traveling as a heavy-equipment operator in the road-building industry.

Although he loved operating heavy equipment, he traded bulldozers for cable machines and started helping on side jobs. Then he got a job with the Suggs Plumbing & Heating Co. in Raleigh-Durham. There, owner Russell Suggs took Harmon under his wing and instilled his deep commitment to career education and development.

"Russell took me by the hand and taught me everything," Harmon recalls. "He wanted his employees to know every facet and every detail of what we did and why we did it. He was a walking wealth of knowledge. I didn't realize until later how fortunate I was to start at a place like that. The pay wasn't much, but the education was priceless."

Harmon next honed his troubleshooting skills at a larger local plumbing company, Brown Brothers Plumbing and Heating, which offered more diversified services. Soon he was going out to jobsites haunted by bad sewer odors and mysterious water leaks that other companies failed to resolve.



Company president Steve Harmon leads a training session. Harmon's deep belief in education shows in his employee training program. He pays if employees join apprenticeship programs at local community colleges. He also provides on-the-job training.

"Training is not a huge cost for us; we build it into the overhead. It more than pays off."

Steve Harmon

He also received more mentoring from the owner, the late Norman Whitaker, who was active in numerous plumbing professional organizations and served as president of the North Carolina Association of Plumbing-Heating-Cooling Contractors.

TAKING THE BIG STEP

"We would walk into situations where others would say it wasn't worth the trouble to find out what's wrong," Harmon notes. "But I loved it, and that

carries through even to today. I gained quite a bit of experience there, thanks to Norman, who was a great teacher and mentor."

Finally, equipped with a master plumber's license, Harmon struck out on his own in 1989. "I wanted to make more money and create my own destiny, instead of having it controlled by someone else," he says.

"I left the company at noon and literally started my own company at 1 p.m. with just a 1985 Chevrolet Astro van and a limited amount of drain-cleaning equipment." He had bought his own tools while working for Brown Brothers.

SCHOOL OF EXPERIENCE

Seminars and webinars are great learning tools, but sometimes real-life experience trumps all. A case in point is a job Steve Harmon encountered in a building that housed a bookstore in Raleigh, N.C.

A sewer odor was making the employees ill, and the drains were sluggish, though not fully clogged, says Harmon, owner of Harmon Plumbing Services. Other contractors had jetted and cabled the lines from a roof vent and inside the building, to no avail.

"First, I talked with the owner and asked him to tell me in great detail what had been done so far," Harmon says. "I asked him if there was space below the building and he told me there was a crawlspace. So I told him I was going to start from the bottom and go up, since no one had done that before."

Harmon's crews put on Tyvek suits and inspected the crawlspace, where they made a surprising discovery: During building renovation, some bathrooms had been eliminated, but no one had capped off the toilet drains. As a result, sewer gas was escaping, and the crawlspace was filled with about three inches of sewage because it wasn't traveling to the mainline.

"The other guys' jettors had just pushed the sewage under the building, and they'd left thinking the drains were free and clear," Harmon says.

But that wasn't all. Harmon saw that the street in front of the building was higher than the building, which meant there had to be a pump somewhere to move the sewage uphill. He knew from experience that a failed pump would explain why the sewage was accumulating near the uncapped, terminated drains.

"I asked if there was a pump somewhere, and the owner said no," Harmon says. "But we looked at the electrical panel and there was a breaker for a sewer pump. No one knew where it was, so we used a camera and locator to find it, then dug it up with a backhoe. The whole situation was like uncovering a puzzle."

In the end, Harmon installed a new pump, jetted out sewage from the drainlines, cleaned up under the building and capped off all the toilet drains.

"We get some strange ones, and we love 'em," Harmon says. "The harder they are to figure out, the better. That's what keeps the jobs interesting. It's what you want if you have a passion for the industry. The main thing is to never give up. It's not in my blood."



The Harmon Plumbing staff includes, from left, president Steve Harmon, vice president Karen Harmon, office manager Stacy Given, and plumbers Steve Glenn, Rick Brown and Chris Lyon.

At first, Harmon promoted his business through the Yellow Pages, along with doorknob hangers he distributed in neighborhoods. He also bought into direct-mail coupon packs, sponsored Little League teams and even did a little advertising on a local real estate TV channel that showed houses for sale.

"One of the most important things I ever learned was that for every dollar of debt you have, you'd better have one in the bank or one in receivables, or better. Managing cash flow is your lifeblood to staying in business."

Steve Harmon

and I put myself in that category," Harmon says. "You spend a lot of your time wearing a dozen different hats when you're starting out. If you don't have education at the start, you'd better develop it quick."

Harmon started out doing mostly residential and light-commercial repairs and drain cleaning. Today, his business is about 60 percent residential 40 percent commercial. The first major piece of equipment he bought was a RIDGID K-1500B sectional drain machine, which he still uses. The company's equipment also includes:

- A 4016E trailer waterjetter from Harben Inc.
- A RIDGID SeeSnake camera system with a utility locator.
- Two RIDGID K-60 sectional drain cleaners for up to 6-inch lines.
- A GO68 drum machine for larger lines from Gorlitz Sewer & Drain.
- A Gorlitz GO50 for medium-sized drains.
- A Gorlitz GO15 for small drains.
- Two Super-Vee handheld drain cleaners from General Pipe Cleaners.

The company also relies on a 1998 Chevrolet quarter-ton service truck and two 1999 tandem-axle Ford step vans, both government surplus vehicles Harmon outfitted for plumbing and drain cleaning. The firm uses GPS

"But our best marketing tool is repeat customers and word-of-mouth referrals, which generate up to 85 percent of our business," Harmon says. "People hire you because they feel comfortable with you."

EQUIPPED FOR THE JOB

The worst thing about starting out was fear of the unknown. "A lot of people start businesses without the education they need,

How well you manage that will dictate your entire career. You'll have not only peace of mind, but you can forecast cash flow. It's a great management tool. It gives you the means to buy new equipment when you need it and get a loan when you need it."

One Blau seminar about how to find a break-even point and what to charge served as an epiphany. Harmon saw that he, like many business owners, had no clear idea what it cost to operate and so no idea where to set his rates to make a healthy profit.

"That sparked something in me," Harmon says. "Blau explained that if you're not ashamed of the trade, then don't be ashamed to charge properly for your services. Don't call six other companies and find out what they charge and go from there. You need to figure out the proper charge for *your* company."

Each seminar Harmon attended led him to other worthwhile educators. He also became a member of professional associations, such as the Plumbing-Heating-Cooling Contractors Association. "Their seminars are absolutely worth the cost," he says.

technology that allows dispatchers to track service vehicles.

TAKING TIME TO LEARN

Harmon learned a lot from an accountant he hired in 1994. And he enriches his experience by reading contractor magazines and attending the seminars advertised on their pages. He trained himself through seminars by Maurice Maio and flat-rate pricing pioneer Frank Blau.



From left, Rick Brown, Steve Glenn and Chris Lyon show off their plumber certifications.



Plumber Rick Brown checks the monitor on the RIDGID SeeSnake push camera during a residential drain cleaning.

FOCUS ON TRAINING


Harmon's deep belief in education shows in his employee training program. Harmon pays if employees join apprenticeship programs at local community colleges. He also provides on-the-job training – "those things you don't

"Our best marketing tool is repeat customers and word-of-mouth referrals, which generate up to 85 percent of our business. People hire you because they feel comfortable with you."

Steve Harmon

necessarily learn in a book." In the end, training creates loyal employees who appreciate that someone invests in them.

"Training is not a huge cost for us; we build it into the overhead," Harmon says. "It more than pays off. When our technicians talk to customers, they know how to talk, are confident in their decisions, and are better plumbers and drain cleaners for it. It's better than throwing them out on the seat of their pants."

To reward apprenticeship graduates, Harmon and other area plumbers and drain cleaners pitch in money for a dinner and donate power tools to get them started. "It's a form of giving back," he says. "You can't just take, take, take from the trade that got you where you're at. I had the opportunity, so I want to pass it along to others." 

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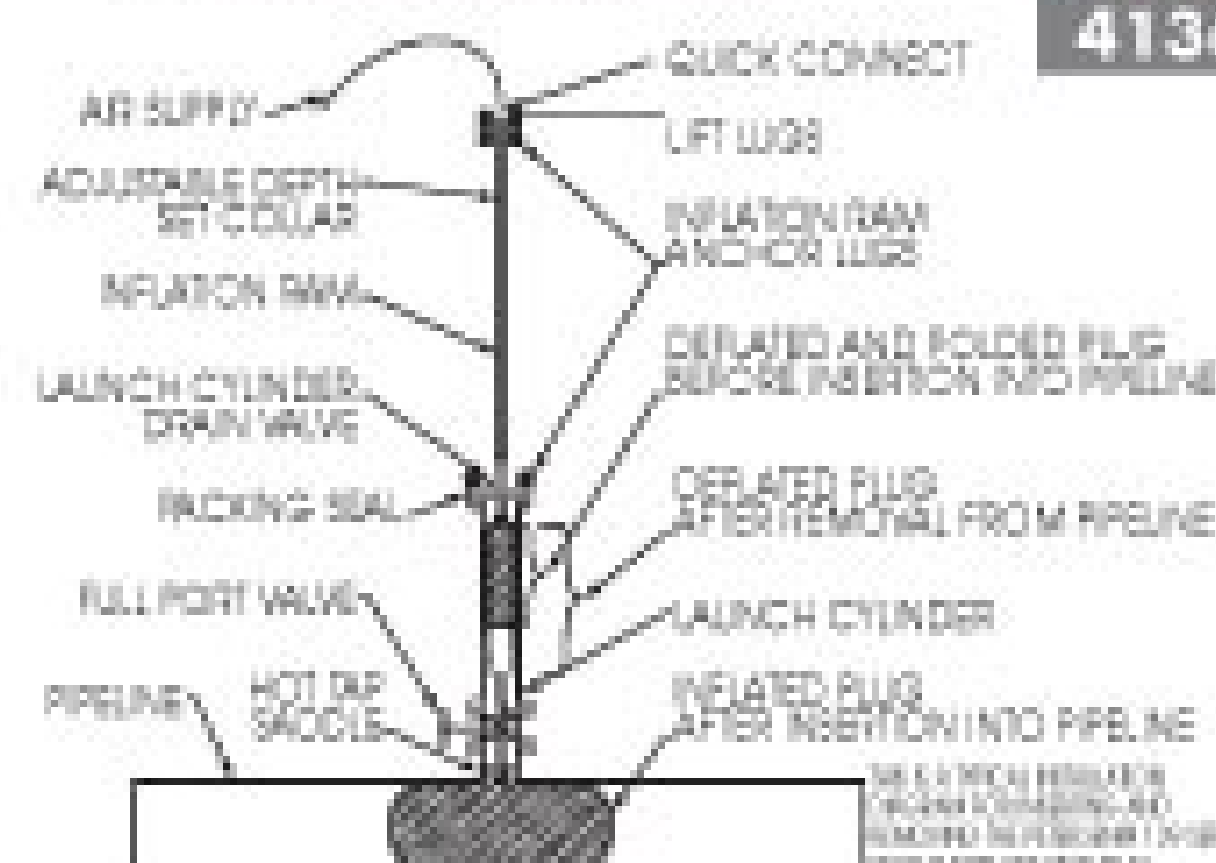
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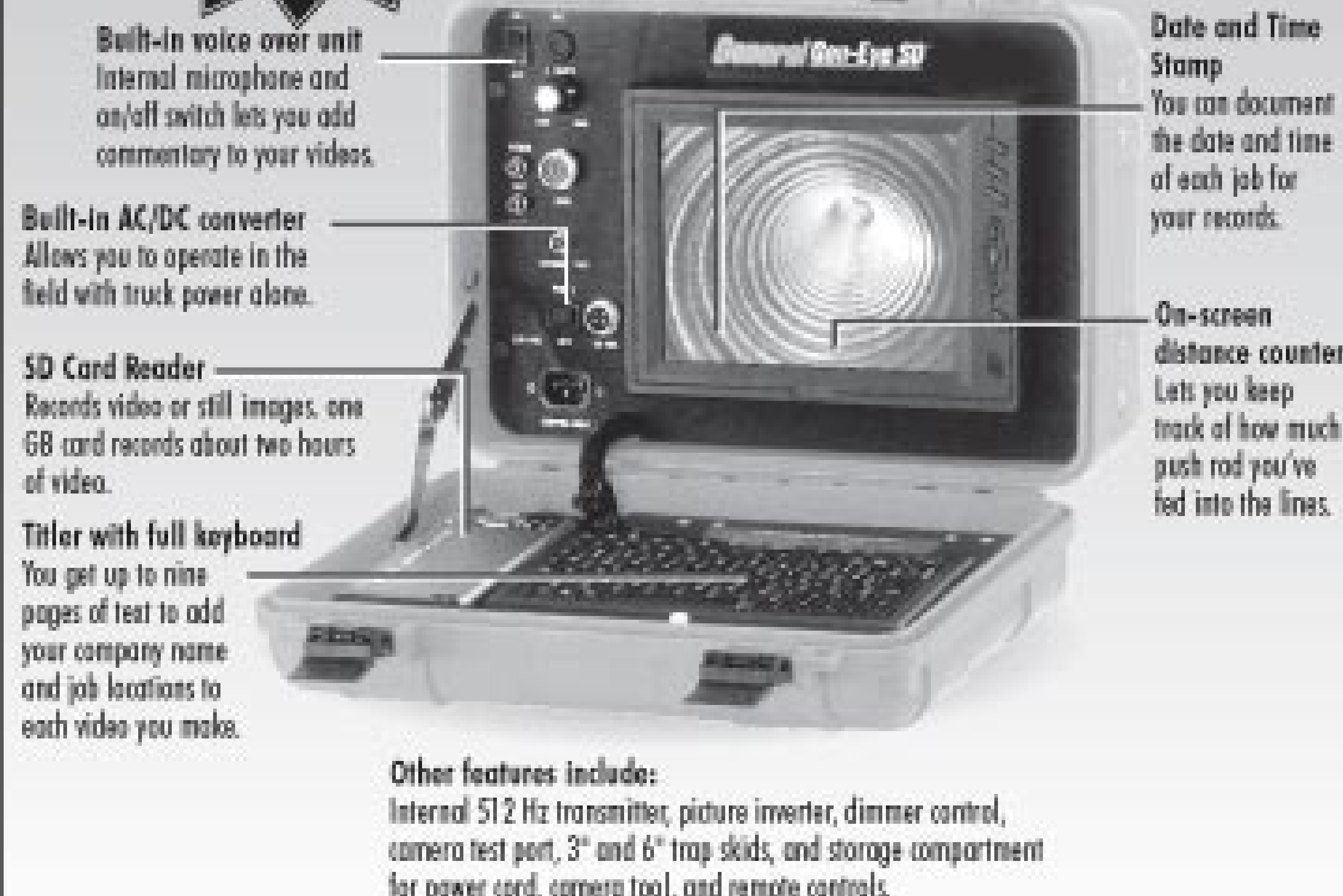
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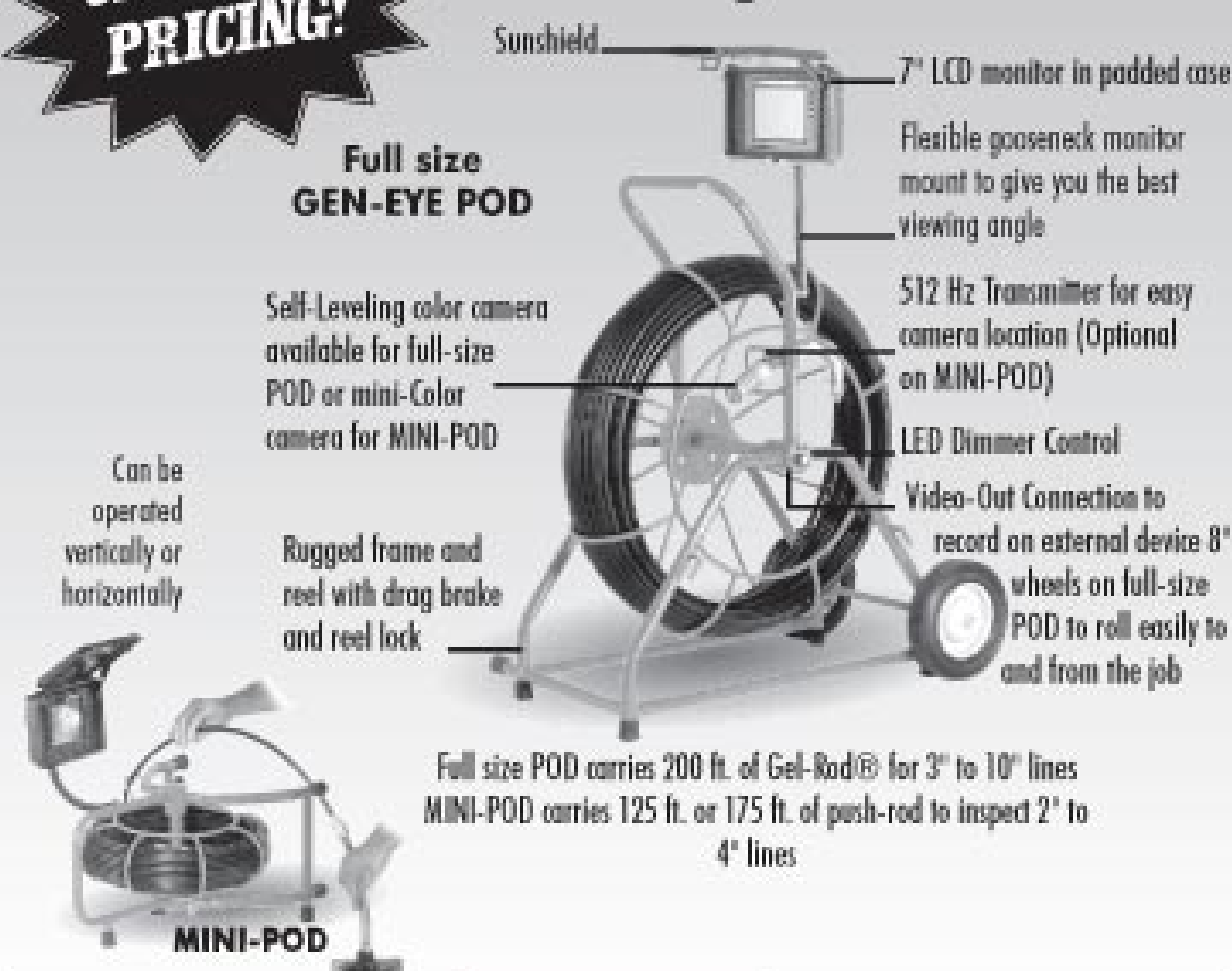
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CONTRACTOR ON THE CUTTING EDGE IN A
COMPETITIVE URBAN MARKETPLACE
BY MARIAN BOND



Morr-Is Tested crew members Mike Luzzi, left, and Jason Lee lower a robotic cutter and OZII camera from CUES into a manhole. (Photography by Dean Thomas)

When it comes to competing in a major market, few do it better than Jeff Cravens, owner of Morr-Is Tested, with offices in Yorba Linda, Calif.

Perched smack in the middle of the densest population in the state, the company provides water and sewer line services for Los Angeles and Orange counties, home to nearly 14 million people. And that doesn't include the adjoining counties of Riverside, San Bernardino and San Diego, where the firm also operates.

Cravens is a small operator, but that hasn't stopped him from forging ahead, and making important decisions on adding equipment and offering a wider menu of services using the industry's latest technologies.

The company has a specialty in video inspection with a substantial fleet that offers capability to support cured-in-place pipe lining and to inspect sewer laterals from the main.

EXPANDING THE SCOPE

The company started in 1984 testing new and old waterlines for leaks and doing small leak repairs, often six days a week. Cravens was initially a partner with his uncle Bill Morris.

Cravens bought out Morris in 1992, and five years later he expanded into CCTV inspection with a CUES camera system. Today, the company operates four CUES 16-foot box vans on Ford chassis, and at least three are out on jobs five days a week. Six employees along with Cravens work in the field. Their equipment yard is on an acre in Placentia.

Today, half the business is in CCTV, using CUES OZII pan-and-tilt cameras and Granite XP survey software. The balance of the work is in cleaning or repairing main waterlines and mainline sewers. Most customers are construction contractors doing new street and sewer installations and repairs. Cravens works mainly as a subcontractor on major projects in the region.

"We're kind of in a neat location now, as there is some construction going on," says Cravens. "We video to make sure storm drains and sewer lines are clean. This is the last time the city gets to tell the developer yes or no and then release the bond money they hold. The developers want to be sure the job is finished."

"We video lines before they do road work on residential streets, and then after work is completed. There is also a lot of utility work that has to go on. In Los Angeles and Orange counties, the sewer systems are getting older and are having to be inspected, repaired and in some cases upsized. That's one reason we got into cured-in-place pipe lining in 2008."



Crew member Rudy Soria observes an inspection from the control console inside the company's CCTV van.

The MaxLiner USA lining system enables the company to do manhole-to-manhole lining as well as point repairs. To support lining operations, Cravens equipped one service van with the CUES Standard Kangaroo lateral reinstatement cutter along with CCTV. The van operates with 1,000 to 1,500 feet of video cable and can be used in 8- to 12-inch pipe.

ADVANCED INSPECTIONS

In addition, one inspection van carries the LAMP lateral launcher from CUES, a system for inspecting sewer laterals from the main. The lateral camera travels up to 80 feet into the lateral, Cravens says the system is highly efficient.

"We video to make sure storm drains and sewer lines are clean. This is the last time the city gets to tell the developer yes or no and then release the bond money they hold. The developers want to be sure the job is finished."

Jeff Cravens

"I'm about the only one in the area with this equipment," he says.

Cravens also operates one OZII camera strictly for inspecting potable water mains. Although it is used just once or twice per month, the capability sets Morr-Is Tested apart from the competition. The camera is used in cases such as where a water main that runs under a freeway has collapsed. It is also used for inspections in new construction.

Standard equipment on the inspection vans includes a color pan-and-tilt camera, 2,000 feet of video cable, the Granite XP software with PACP Coding, and hard copy and electronic data deliverable from the truck.

The company also owns two Vac-Con combination trucks carrying pumps from FMC Technologies that deliver 3,000 psi/40 gpm and 2,000 psi/65 gpm. "These pumps have a lower volume but do a good cleaning job, particularly on smaller pipe," Cravens says. "We utilize water as best we can." The cleaning nozzles are from StoneAge Inc. and ENZ USA.

profile

MORR-IS TESTED, YORBA LINDA, CALIF.

OWNER:	Jeff Cravens
ESTABLISHED:	1984
EMPLOYEES:	6
AREA SERVED:	Counties of Los Angeles, Orange, San Bernardino, Riverside, San Diego
SPECIALTIES:	CCTV inspection, cleaning, pipe lining
WEBSITE:	www.morristested.com



LOWER PHOTO: The camera looks up at the company's robotic lateral reinstatement cutter from inside a manhole. RIGHT PHOTO: Crew member Jason Lee tests for the presence of toxic gas in a manhole with an Orion (MSA) gas monitor.



SAFE IN TRAFFIC

The equipment is effective in cleaning clay pipe in the older sections of the many cities, as well as the PVC pipe that has been popular since the 1980s. "PVC pipe has held up well," says Cravens. "We televised a big job four years ago, and everything looked really good. That might be because of the longer pipe sections and fewer joints for roots to intrude."

For crews working in the streets, the Southern California traffic is always a concern.

"When you go down a busy street here to do a job, you have to be prepared," says Cravens. "There is always a concern to stay in compliance with federal laws. We have to go by the Manual of Uniform Traffic Control Devices. There must be stamped engineering plans for traffic control before a permit is granted."

Sometimes the plans are provided by the prime contractor, but often Cravens is asked to get the approved plans. For that, he relies on any of several traffic-control companies. "Companies larger than mine will have an engineer on staff, but that would be too costly for a small operation," Cravens says.

Because of the traffic concerns, Morr-Is Tested often works at night with some lanes closed off. Cravens makes sure his technicians take safety classes.



"They have to do this," he says. "They have to feel safe. That's what it boils down to."

MAKING THE CALL

When Morr-Is Tested is called to work as a subcontractor, Cravens asks a variety of questions: What does the job involve? How deep are the lines to be cleaned? Where will the debris be taken? Who provides the water? What about traffic control? He has been known to turn jobs down. One recent caller wanted to do a price quote over the phone. "I said no," Cravens recalls. "Not without looking at the job."

"The bottom line right now, it's not about whether you turn a profit, as long as the customer is happy, because the profit will be there when times are better."

Jeff Cravens

Typically, the company is on a jobsite from one day to one week. One recent project was in a remote area of central California, 200 miles from home base. Morr-Is Tested was subcontracted to televise and provide an external condition assessment on a 24-inch cast-iron pipe within a 5- by 7-foot gunite utility tunnel.

This mile-long tunnel had been constructed through the base of a mountain. The only access was through a secured jail area, and service technicians

SHARING THE LOAD

Over 26 years in the business, Jeff Cravens has established Morr-Is Tested on networking with customers as well as competitors, and on encouraging his employees to follow the same high standards he sets for himself.

"I emphasize the importance of all this with my employees," he says. "My guys know I keep a quality check on our work. If there is a problem with a project, they can always call me."

He knows he has competitors with much larger businesses. "This is a small industry actually, even though we are in a huge market," he says. "Many of my competitors have been around as long as I have. We trade work. If we don't have the equipment or personnel, we will call them – send them, business. They do the same for me. It's all about quality service and networking. And it's all about word of mouth."



Morr-Is Tested crew members include, from left, Andrew Rasmussen, Jorge Silva, Scott Simons, owner Jeff Cravens, Mike Luzzi, Jason Lee and Rudy Soria.

and their equipment had to be inspected and inventoried by security each time they entered or exited. The pipe carried various utility services, and suspension supports for it were anchored to the tunnel floor.

"Our camera experienced much difficulty squeezing between the pipeline suspension anchors and the sides of the tunnel," says Cravens. "The operator had to steer the camera coming back to keep it from lodging, turning over, or having the cable wrap up in the wheels of the crawler. Precision timing in winching the cable back and steering the camera was difficult."

Because of the length of the tunnel, the camera had to enter from each end, each time covering 2,000 feet. Although the inspection did not achieve full overlap, it provided enough data to give a representative picture of the pipe's

condition. The crew completed the job in 14 hours spread over two days.

Along with superior equipment Cravens keeps his employees on their toes and on the job, and that's a challenge. "The hardest thing right now is to convince the guys of the importance of the quality of our work, and that if they strive to do a fast and efficient job, we will get the call back," says Cravens.

"They know we're not making a lot of money right now, but I stress that time is money. That's what you have to do. I go out of my way to keep my guys working, and in return they give me their best. The bottom line right now, it's not about whether you turn a profit, as long as the customer is happy, because the profit will be there when times are better." ■

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Are You Outrunning the Bears?

SIMPLE FINANCIAL RATIOS CAN HELP YOU KEEP A CLOSE EYE ON YOUR COMPANY'S HEALTH AND MAKE MID-COURSE CORRECTIONS IF NEEDED

BY KENNETH STUBBE



Kenneth Stubbe has nearly 20 years of business development, consulting, financing, and community economic development experience. He is a certified Economic Development Finance Professional and a Certified Economic Developer.

Two guys are hiking in the Alaskan wilderness when they realize they're being stalked by a hungry grizzly bear. One of them bends down to tighten his shoelaces, stretches, and discards his backpack. His partner asks him if he seriously thinks he can outrun a bear. "No," he replies, "but all I have to do is outrun you."

We've all heard a version of this old joke. Still, there is a bit of truth to it, especially for service businesses. Can your crew outrun and out perform the competition? Is your company efficient, lean, responsive and well managed?

By regularly monitoring financial performance ratios, you can provide a cardio workout that gives your business endurance and speed. It's simple. Just regularly ask yourself what bankers and savvy customers would ask.

- Have you invested enough cash to safely run daily operations?
- Do you rely too much on debt, showing lack of planning or commitment?
- Do you pay your bills on time?
- Do you collect what you're owed in a timely manner?

Using simple performance ratios, you can calculate financial metrics from your financial statements. They work even better if you use a knowledgeable accounting professional to develop a financial monitoring system for your business. Here is a look at five metrics used in a basic system for a service business.

CURRENT RATIO

The current ratio measures working capital – your ability to meet current obligations. It measures how many dollars you have within current assets for every dollar in current liabilities. A current ratio of 2:1 (\$2 available for every dollar of current liabilities) is considered healthy.

Bankers believe in the current ratio, and that's a good reason to monitor it. Still, it presents only a vague picture of your working capital use. For example, it doesn't show problems like too much cash invested in receivables. While it can show long-term cash utilization trends, it's important to use other monitoring methods, along with it.

QUICK RATIO

The quick ratio (acid test ratio) is a crisis liquidation ratio also used by bankers to analyze cash flow quality. It measures how quickly you can meet all current obligations. A quick ratio of 1:1 (one dollar of cash for every current obligation) is considered safe.

Like the current ratio, the quick ratio is most useful for trend analysis. And it doesn't hurt to know if your business can pay all its bills in a given month, in case you would ever need to. Still, you should have other monitoring methods.

Using simple performance ratios, you can calculate financial metrics from your financial statements. They work even better if you use a knowledgeable accounting professional to develop a financial monitoring system for your business.



DEBT-TO-EQUITY RATIO

The debt-to-equity ratio shows the proportion of your business that is financed by debt and equity. The two added together, of course, equal the balance sheet value of your business assets. A 3:1 debt-to-equity ratio (somewhat highly leveraged) means you have \$3 of debt for every \$1 of equity, or 25 percent equity.

Bankers analyzing loan requests look for the average debt-to-equity ratio in your industry and at local norms. Even so, they will loan only within a safe range – say, between 1:1 and 3:1. At higher ratios, they will likely insist on guarantees.

That's because high debt-to-equity means you likely have high fixed costs and a greater chance of failure in an economic downturn. Higher debt service means less cash flow for working capital and operating expenses. Lenders also generally feel low owner investment (equity) means low commitment.

DAYS ACCOUNTS RECEIVABLE

Measuring the quality of your customers is important. A sale is not a sale until you get paid. In assessing your financial condition, you should ask: What is our average days accounts receivable? The answer should closely match your payment terms.

For example, terms of 30 days from invoicing should translate to no more than 35 to 40 days accounts receivable. If it's longer than that, you are not getting your operating cash fast enough to meet expenses and generate new sales.

It's not necessarily bad for your days accounts receivable to be longer than your payment terms. It may simply mean one or more of your customers is an 800-pound gorilla. Big companies and government agencies are notorious for paying slowly. Courting these customers takes substantially more permanent working capital, because it takes a long time to get paid. Taking on such a customer without adequate working capital can put you out of business.

DAYS ACCOUNTS PAYABLE

It's also critical to measure the quality of your supplier base and maintain a reputation for paying on time. A growing business needs access to financing, and paying promptly sends a positive message to bankers and potential investors about the character of your company.

It also makes you highly desirable to suppliers – and having more than one supplier for a given item gives you a contingency in case one supplier can't meet a delivery date. On the other hand, if you're paying your bills too soon (your average days accounts payable is shorter than suppliers' terms), you may be missing out on early-payment discounts.

Paying much slower than terms – in effect making suppliers provide a form of financing – makes you much less desirable.

LOOKING TO DASHBOARD

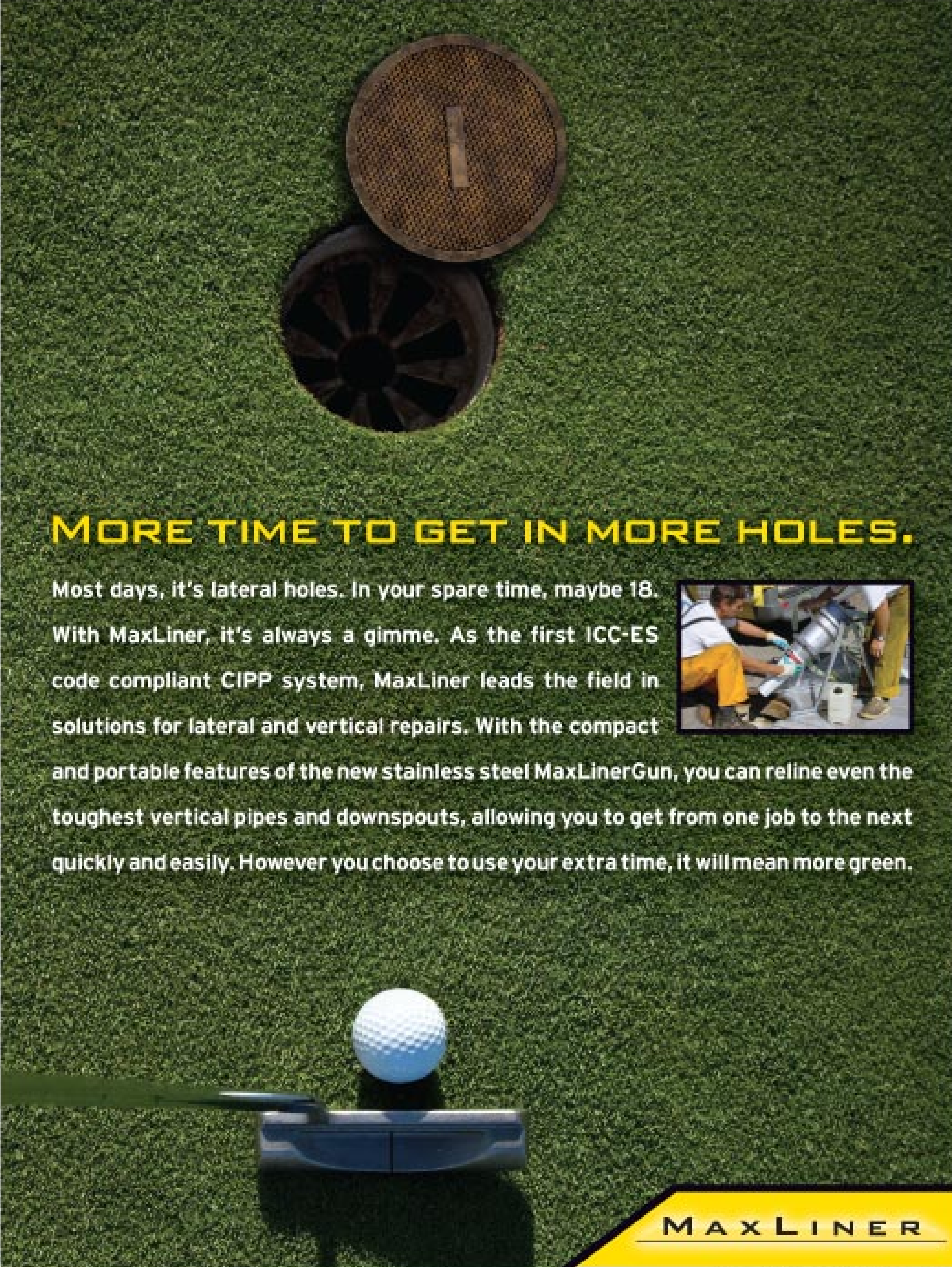
Beyond financial ratios, there are powerful and visually simple tools for monitoring your company's performance. One such tool is a key performance indicator (KPI) dashboard. To develop and use such a tool, you'll probably need a seasoned accountant and a KPI consultant.

Using a KPI dashboard is a complex exercise, but closely monitoring for peak performance and steady progress toward aggressive goals is one thing that sets industry leaders apart. Just a few of the metrics you can visualize with a KPI dashboard include:

- Overall sales volume per service or per customer segment
- Overall margins per service or customer segments
- Operating expenses, benchmarks and metrics


- Days accounts receivable/payable
- Service and productivity metrics
- Debt and leverage metrics
- Return on investment, equity and assets

Whether you look to dashboard tools or rely on traditional business ratios, regular checkups on the numbers can help you keep your business healthy. **C**






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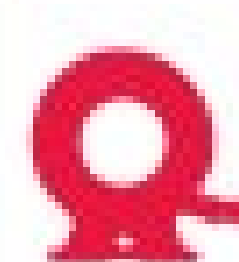


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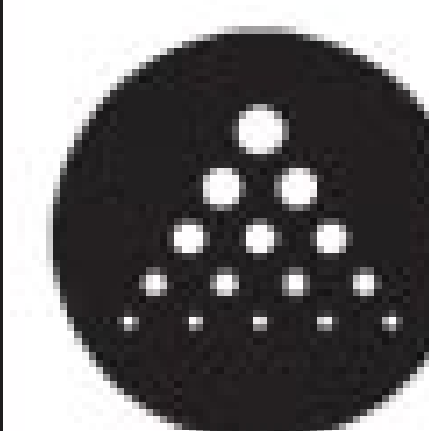
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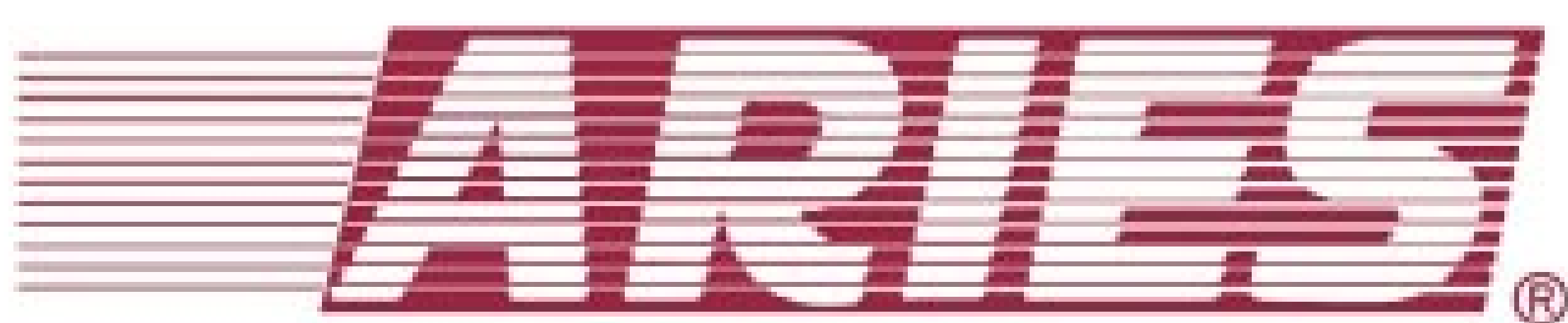
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PATENT PENDING

Learn to Be Outrageously Successful

SPEAKER AND BUSINESS COACH SCOTT HUNTER BRINGS SUCCESS SECRETS THAT CAN HELP OWNERS TRANSFORM THEIR COMPANIES

BY TED J. RULSEH

After more than 20 years of working in and observing companies of every type and size, Scott Hunter has noticed a trait all successful firms share. "They have enthusiastic, confident, optimistic, appreciative and happy people who work together on behalf of a future they have all committed themselves to," says Hunter, a speaker and business coach who presents a series of seminars at the Pumper & Cleaner Expo in Louisville, Kentucky on "The Mindset of Leadership" and "Creating an Outrageously Successful Organization." His Education Day program begins at 8 a.m. in Room C109-112.

Hunter, also author of the book, *Unshackled Leadership*, helps companies transform themselves through his keynote speeches, workshops and retreats. Since 1985, he has worked with hundreds of businesses and more than 250,000 people, helping to produce breakthroughs in personal and professional lives and setting the stage for companies to achieve results far beyond expectations.

ALL ABOUT PEOPLE

"People who come to the Pumper & Cleaner Expo have a particular expertise,

and there is an art and science to what they do," says Hunter. "But there is also an art and science of how to run a business successfully and profitably, and that's what many people don't understand."

The morning sessions focus on the people skills it takes to be truly successful. "We'll show attendees how to be leaders, how to build a team, how to inspire and motivate people, and how to have their business be a place where people

"You don't want to be focused just on making money. You want to be focused on creating that group of enthusiastic, confident, optimistic, appreciative and happy people."

Scott Hunter

want to work," Hunter says. "It's about listening to people. It's about caring for people. It's about being focused on building a team."

"You don't want to be focused just on making money. You want to be focused on creating that group of enthusiastic, confident, optimistic, appreciative and happy people."

MOOD DRIVES SUCCESS

The afternoon sessions explore "laws of the universe" that, if obeyed, could put a company on the road to outrageous success. "A business is a collection of human beings, and as a result it has a collective energy, or mood, that determines what is possible," Hunter says.

"Your results are very much a function of not how skilled you are but of the mood of the people in your organization. If the mood is upbeat, enthusiastic, positive and optimistic, and people are all pulling together, you're going to have great results."

"The Law of Attraction says we attract to ourselves that which is consistent with our predominant mood. So if you go around being frustrated and angry, you'll attract things that support you in being frustrated and angry. But if you go around being happy, joyous and appreciative, you'll attract things that support you in being happy, joyous and appreciative."

"Another law says we'll always find what we go looking for. So if you think life is rotten, guess what – it is! But if you think there are opportunities out there, you'll start noticing opportunities. Your brain is wired to help you find evidence for what you believe to be true. So why not believe the world is full of great opportunities?" Hunter says people tend to underestimate their power to influence others.

"People will show up around you as who you believe them to be," he observes. "If I think you are wonderful, then around me you'll get to be wonderful. You want to think about your employees and customers as being fabulous and wonderful. Look for the gold and the goodness in people and you'll notice how they show up as wonderful around you." e



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RED-HOT COUNTRY PERFORMER – AND ONE-TIME PUMPER –
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BY JIM KNEISZEL



How's this for the hottest ticket in town: The Pumper & Cleaner Environmental Expo and Dierks Bentley.

The *can't miss* trade show for environmental services professionals collides with the *can't miss* country music performer of the past year. When Bentley takes the stage at Louisville's Freedom Hall March 5, he will have just learned the fate of his three nominations from the 2010 Grammy Awards.

Bentley, 35, has had numerous No.1 country hits since his 2003 debut album, but last year's bluegrass-influenced *Up On The Ridge* took him to a new level. Recording with an ensemble of the hottest new stars – Punch Brothers, Miranda Lambert and Jamey Johnson – Bentley produced the contemporary country music that built his career, but used the acoustic sound that instilled his love of country music in the first place.

"I had a blast making this record," Bentley said in an interview. "It was the most fun I've really ever had making a record. Bluegrass music is what really first got me turned on to country. I don't think I'm a traditionalist. I love country music and putting my own stamp on it. And using acoustic instruments is a big part of the formula; I want to push the boundaries of what you can do with them."

A PUMPING PAST

Beyond music, there's another reason the Expo crowd will enjoy this down-to-earth performer: He's been a pumper. One of the many jobs he had before landing a contract in Music City was pumping out holding tanks on houseboats at Lake Powell in his home state of Arizona.

"I loved the lake and I loved being up there," Bentley explains. "In the mornings, I'd go down and show the customers how to drive the boats – 35- to 60-foot houseboats. When the boats came back, we'd clean them from top to bottom, scrub the roofs and decks, pump out the tanks, and get them ready to go the next morning."

Boats typically had 250-gallon holding tanks, and that waste was pumped through a pipe system installed at the marina. Careful evacuation of the tanks and constant cleaning is vital because Lake Powell provides a freshwater supply for an expansive desert territory in the Southwest.

Bentley always enjoyed physical labor (he built decks for a time and retrieved golf balls at a driving range) and appreciates hard work. The jobs he didn't like were in Nashville offices while he paid his dues in the music business.

"I poured coffee all over this town and worked in every building in Nashville before I got a publishing deal," he recalls. "I like physical labor, but emotionally being in Nashville and working day jobs while trying to get a record deal was the toughest."

QUIT THE DAY JOB

In 2003, Bentley's first single, "What Was I Thinkin'" topped the country chart. His 2005 album, *Modern Day Drifter*, went platinum. That year he became the youngest member of the Grand Ole Opry and received the Country Music Association's Horizon Award. He followed with the 2009 album, *Feel That Fire*, which included two No.1 hits, the title track and "Sideways."

Then Bentley had a thought. What if he returned to the bluegrass music he fell in love with when he arrived in Nashville years ago? So he called his friends in

the band Nickel Creek and started planning *Up On The Ridge*.

"I've always been a big fan of Nickel Creek, and I knew (mandolin player and singer) Chris Thile from bounding around in the bluegrass circles," he says. "They were really out there with the progressive acoustic music and I really enjoyed what they did. I had moved here to do country music, and I walked into a bar and they were singing country songs using acoustic instruments. I really fell in love with that sound, and it gave me a foundation to start from."

Thile's new critically acclaimed band, Punch Brothers, recorded a number of tunes with Bentley, including a daring cover of the U2 hit, "Pride (In The Name Of Love)." Besides the Punch Brothers, the song features the high lonesome sound of bluegrass legend Del McCoury.

At first, friends didn't understand Bentley's choice to cover a rock band like U2, but "Pride" became one of several hits from the record, which also features "Bad Angel" with Lambert and Johnson, and the title track. "Pride" and "Bad Angel" were nominated for Grammys, and *Up On The Ridge* for Best Country Album Grammy.

"It's important for us to have a high-energy show and a lot of fun. If it's a good night for us, everyone else will have a good time. This is one of the first shows we'll have for the year and everybody will be extra excited to be out there playing."

Dierks Bentley

"It's a tough song to cover, but you know if you're going to cover a song by a group like that, pick a big one," Bentley says. "It was a little daunting. They're one of my favorite bands, and you knew going into that song that it's going to go one way or the other. Either it's going to get a Grammy nomination or it's going to be a disaster."

ELECTRIC AND LOUD

For the Expo, Bentley will perform an acoustic set from *Up On The Ridge*, but mostly he and his five bandmates will be plugged in and rowdy for Freedom Hall, where he has played numerous times. "The shows tend to be electric and loud," he says. "We like to have a good party atmosphere going. But we'll break it down and get the upright bass and banjo out and do some things from this record."

"It's important for us to have a high-energy show and a lot of fun. If it's a good night for us, everyone else will have a good time. This is one of the first shows we'll have for the year and everybody will be extra excited to be out there playing."

It might be hard for Bentley to pry himself away from his family in Nashville to start touring again. He, wife Cassidy and daughter Evie, welcomed the birth of their second daughter, Jordan Catherine, a month ago on Christmas morning. But he's looking forward to meeting Expo fans and might bring some photos from his pumping past to share. "These are the folks I hang out with at shows," he says. "The hardworking people."

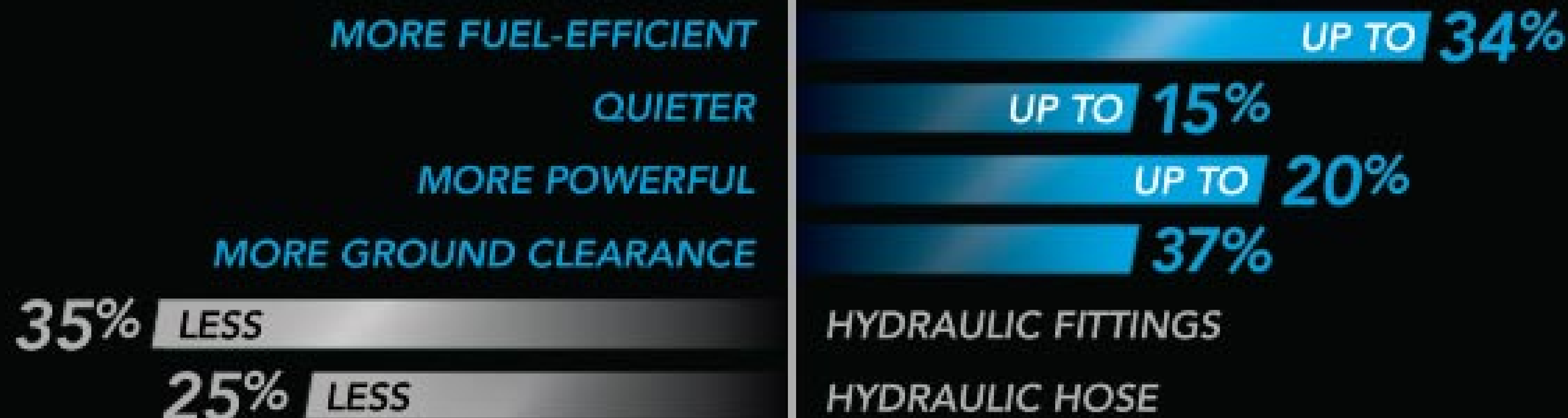
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JUST FOR YOU!

Pumper & Cleaner Environmental Expo exhibitors offer a preview of their latest technologies and services

By Ed Wodalski

Ask anyone who's been to the Pumper & Cleaner Environmental Expo and they will tell you one of the reasons they keep coming back is to see the latest products and services for their industry. With hundreds of exhibitors, thousands of products and more than 500,000 square feet of floor space to cover, it's difficult to see it all.

To make sure you don't miss out on any of the new breakthroughs at the Kentucky Exposition Center, show sponsor COLE Inc. has dedicated an area exclusively to new products. Introduced in 2010, this year's exhibit is moving to larger quarters and is expected to double in size. The display opens on Wednesday, March 2, for a pre-show sneak peek and will remain open during regular show hours.

There's also an interactive floor plan on the Expo website (www.pumpershow.com) to help you pre-plan your visit. So whether you're a first-time visitor or long-time guest, we're certain the 31st Annual Expo will have what you need to become more efficient and your business more profitable. As a start, here's a look at some of the products and services you don't want to miss.

INSPECTION SYSTEMS

1 Aries Industries Inc.

The PE3600 mini pan-and-tilt camera from Aries Industries Inc. features a rotational wiper system that enables the operator to clean the camera lens and light windows while still in the line. Infinitely Continuous Dual Axis Rotation Technology returns the camera to production after cleaning. The unit is compatible with most Aries inspection equipment, including the Seeker push camera, Pathfinder wheeled transporter and Lateral Elevation Television System (LETS). 800/234-7205; www.ariesindustries.com, Expo booth 1008.

2 CUES Inc.

The K2 Series portable CCTV pipeline inspection system from CUES Inc. can be mounted on ATVs, vans, trucks or used as a stand-alone system. The unit includes a wireless handheld control that can operate all CUES transporters and pan-and-tilt cameras. Features include built-in diagnostics, including video cable. The portable video cable reel includes automatic payout to minimize cable drag and maximize pull distance while inspecting pipes from 6 to 12 inches in diameter. The base station can be mounted on the built-in docking part of the reel, staged independently or in a weatherproof enclosure. The unit can be used with Granite XP Asset Inspection/Decision Support software for seamless data integration with asset management and GIS mapping systems. 800/327-7791; www.cuesinc.com, Expo booth 1068.

3 Envirosight LLC

The QuickView zoom inspection pole camera from Envirosight LLC is designed for rapid, complete assessment of pipeline infrastructure. The system includes a pole-mounted viewer/recorder with wireless roaming, optional auxiliary camera for manhole viewing and rugged travel case. Features include Haloptic technology that combines lamp, reflector and camera for a halo of illumination. The concentrated beam floods pipe walls, illuminating distant tar-

gets for maximum clarity. The system can store up to 16 GB of video and still images on a micro SD card, while the monitor unlocks for wireless viewing at distances up to 32 feet. 866/936-8476; www.envirosight.com, Expo booth 1130.

4 RapidView IBAK North America

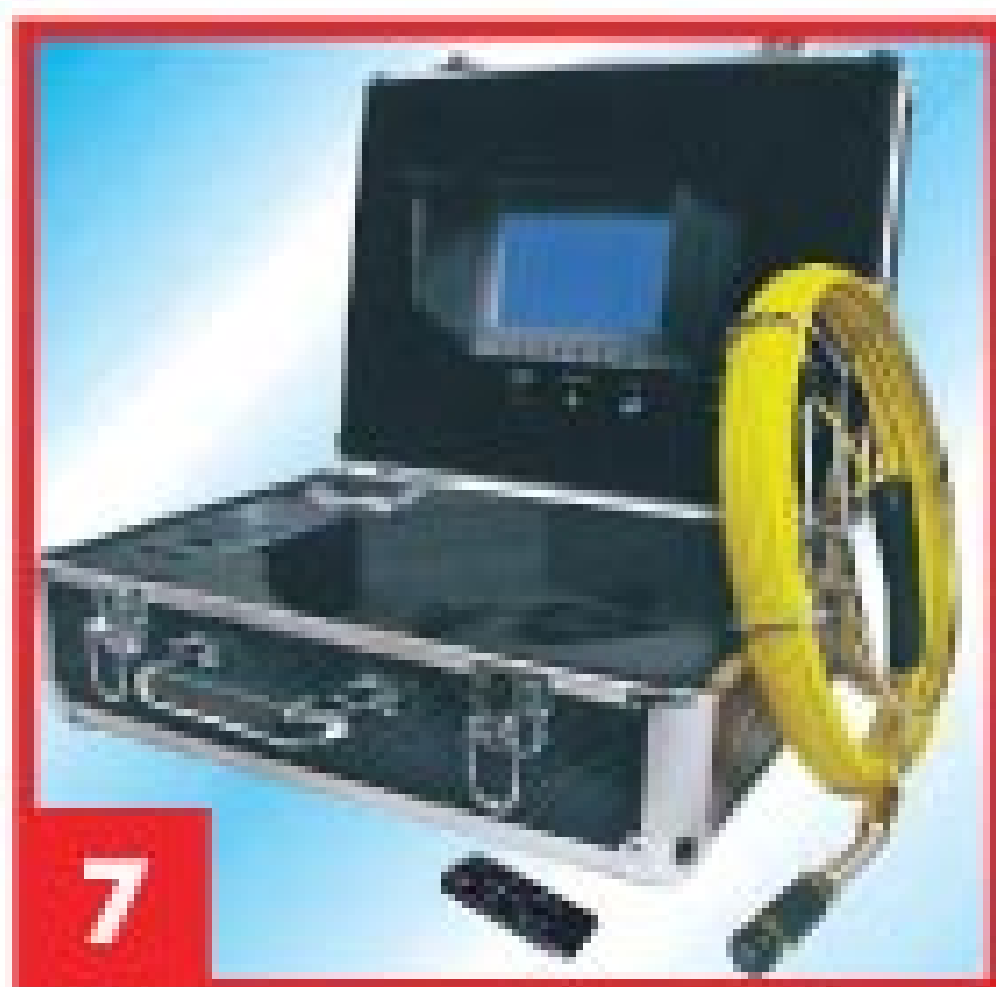
The LISY 3 lateral launch inspection robot from RapidView IBAK North America is designed to travel 500 feet up a mainline sewer, inserting a pan-and-tilt camera and inspecting as much as 100 feet up the lateral line. The modular launching system can be attached to an existing mainline crawler, reducing the need for redundant equipment. 800/656-4225; www.rapidview.com, Expo booth 2130.

5 General Pipe Cleaners/Div. General Wire Spring

The Gen-Eye X-POD inspection system from General Pipe Cleaners combines the 24-inch compact frame of the MINI-POD with a standard size Gel-Rod and self-leveling camera. The system is designed to inspect 3- to 10-inch pipes in lines up to 100 feet long. Features include 7-inch LCD color monitor with padded case, picture inverter, steel frame that can be operated vertically or horizontally, AC and DC power cords, LED dimmer control, 3-inch trap skid, 512 Hz transmitter and video-out connection for recording to an external device. 800/245-6200; www.drainbrain.com/pod, Expo booth 6077.

6 Vivax-Metrotech Corp.

The vCam inspection system from Vivax-Metrotech Corp. includes modular control module with 8-inch color LCD monitor, dual-frequency transmitting sonde, digital recording to the internal hard drive or SD card, full-function keyboard, internal microphone, AC/DC power, rechargeable batteries, USB interface, video and audio RCA jacks, distance counter and camera LED brightness control. The control module's modular design makes it field serviceable. The system can inspect pipe from 3 to 12 inches in diameter from distances of 60 to 400 feet. 800/446-3392; www.vxmt.com, Expo booth 4032.



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7 Forbest Products Co.

The FB-PIC3188D portable sewer/drain basic inspection system from Forbest Products Co. includes a 7-inch LCD monitor with built-in DVR, CCD color camera and 65-foot fiberglass push cable (100- and 130-foot cables available). 650/757-4786; www.forbestusa.net, Expo booth 4150.

8 Remote Vision/JLF Enterprises LLC

The Remote Vision System portable, pole-mounted, battery-operated camera inspection system from JLF Enterprises LLC is designed for inspecting manholes, vaults, tanks and other confined or hazardous areas. The system can be used in light or dark conditions, in water or out, overhead or underground. Systems include camera, cable, monitor, carrying case, 18-foot telescoping pole, on-board batteries and power cords. 612/221-6690; www.remotevisionsystem.com, Expo booth 4020.

9 Hathorn Corp.

The Optimum HDD lateral push camera system from Hathorn Corp. records directly to a 320 GB hard drive or USB stick. Files can be transferred between drives or to a computer. The system features one-touch recording. The reel-mountable control unit has an 8.4-inch LCD monitor, mini keyboard and built-in 2-hour battery pack. Other features include onscreen footage counter, voiceover recording, 512 Hz sonde and adjustable lighting. The system comes with a 200-foot reel, self-leveling camera head or a 200-foot mini reel with mini color camera head. 905/886-2835; www.hathorn-corp.com, Expo booth 7096.

10 RS Technical Services Inc.

The TranSTAR II steerable tractor and TrakSTAR II zoom camera from RS Technical Services Inc. are designed to inspect 6- to 30-inch lined sanitary and storm sewer pipelines. Mounted together the units measure 20 inches long. The tractor has two 90-watt motors and can inspect pipelines at up to 65 fpm. The six-wheel-drive

unit can turn on its own axis and has freewheel for quick retrieval. Multiple wheel types and optional camera lift are available. The pan-and-tilt camera features a 16-bit digital signal processor, 360-degree rotation, 32 linear light settings, onscreen camera data display and prompts for setting calibration, as well as programmable home positions for the camera head. 800/767-1974; www.rstechserv.com, Expo booth 4069.

11 Cobra Technologies

The 8-inch wheeled transporter from Cobra Technologies is designed for the inspection of 7- to 60-inch diameter pipe. The low-profile transporter offers maximum ground clearance and easily maneuvers through 8-inch lined pipe. Features include electric-tooth clutch wired in parallel with the motor for automatic freewheel capability. When power is removed, freewheel is automatically selected for quick recovery. Using wheels and remote elevator, the transporter can inspect pipes up to 60 inches in diameter. High-traction carbide wheels are offered as an option for use in PVC and lined pipe. Measuring 20 inches in length, including the Cobra PTZ camera, other transporter features include solid bronze body for optimum weight/power configuration. A lightweight aluminum model is available. 800/443-3761; www.cobratrac.com, Expo booth 7061.

LINING SYSTEMS

12 Flow-Liner Systems Ltd.

The Neofit potable pipe lining system from Flow-Liner Systems Ltd. is designed for lead, copper, polyethylene, PVC or steel water service lines from 1/2- to 1 1/2-inch I.D. The flexible PET liner is pulled through the pipe and expanded, forming a thin-walled protective barrier. The lining system is NSF/ANSI 61-G certified. 800/348-0020; www.flow-liner.com, Expo booth 7141.

13 Formadrain Inc.

The LMC (lateral-main-connection) lining repair system

from Formadrain Inc. is made for repairing Tee and Wye sewer connections from 4-to-4 inches up to 24-to-8 inches. The inflatable rubber T-shaped tube requires three access points for repair: two manholes and one cleanout, inside or outside of the building. The steam-cured NSF-certified lining system includes fiberglass, polyethylene sheeting and Styrene-free epoxy. 888/337-6764; www.formadrain.com, Expo booths 4200, 4201.

14 Infrastructure Repair Systems Inc.

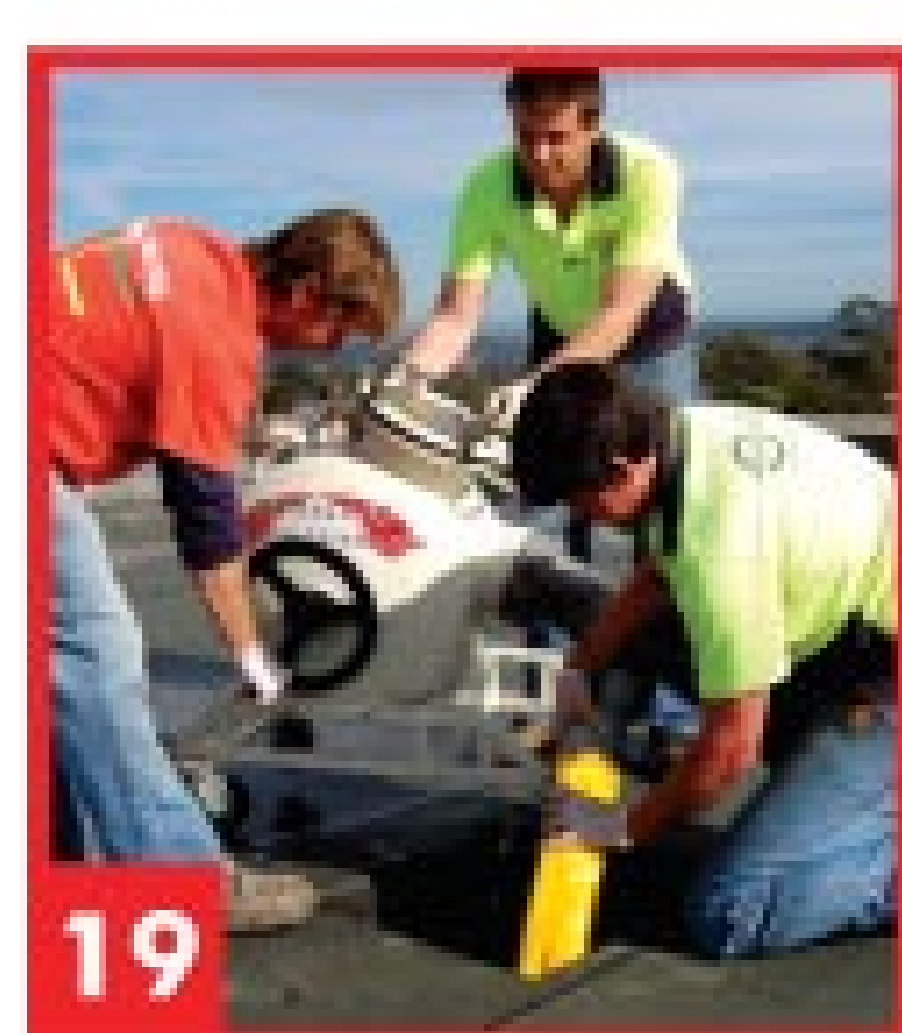
The Lateral Point Repair system from Infrastructure Repair Systems Inc. offers three liner weight choices with push or pull delivery. The ASTM 1216 certified sewn felt/fiberglass liners include hook and loop straps and strings, ambient-cure epoxy and no VOCs. 877/327-4216; www.irsinc.net, Expo booth 25.

15 LMK Technologies Inc.

The Schwalm Pipe Rehabilitation Robot, manufactured by Schwalm Robotics and distributed by LMK Technologies Inc., is a self-propelled, remote-operated cutting tool engineered to remove protruding tabs and trim off-set joints prior to cured-in-place pipe lining mainline pipe. Designed to quickly re-instate services from accessing one manhole, the robot features a pan-and-tilt camera with lens-washing device, ensuring the operator has a clear view of the work being performed. The robot also is capable of cutting straight forward, crawling through collapsed CIPP linings, inserting mechanical plugs into service laterals and installing LMK's Main to Lateral Shorty and Stubby CIPP connection sealing systems. 815/433-1275; www.performanceliner.com, Expo booth 8203.

16 MaxLiner USA

The lightweight, stainless steel MaxLinerGun from MaxLiner USA is designed for small-diameter CIPP relining projects, including lateral and vertical pipes. The gun enables installers to repair traditional laterals as well as interior drain pipes behind walls and beneath floors. 276/656-1225; www.maxlinerusa.com, Expo booth 7187.



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17 AP/M Permaform Inc.

The PL-8000 centrifugally cast concrete pipe culvert lining from AP/M Permaform Inc. is designed for H-20 wheel loading. The liner is spun-cast the length of the culvert using the concave-convex procedure (CCCP). It contains rust inhibitors to prevent corrosion of the old metal culvert and is highly resistant to abrasion. 800/662-6465; www.centripipe.com, Expo booth 32.

18 Reline America Inc.

The BLUE-TEK AR3 liner from Reline America Inc. features glass fiber reinforced plastic and near frictionless veneer for improved flow and abrasion resistance. Used with the BLUE-TEK ultra-violet system, the liner is available in lengths up to 1,000 feet and can be manufactured to fit 6- to 48-inch diameter pipes. 866/998-0808; www.relineamerica.com, Expo booth 2209.

19 Perma-Liner Industries Inc.

The Perma-Lateral inversion lining system from Perma-Liner Industries Inc. is designed to negotiate 22-, 45- and 90-degree bends in 4- through 6-inch pipe. Made from formulated epoxy resins, the lining is NSF Standard 14 approved, can eliminate root intrusion, bridge missing pipe and increase flow efficiency. Offering a 50-year (tested) lifespan, the non-woven/no-stretch liner can seal open joints, stop infiltration/exfiltration and is IAPMO and NSG certified and ICC (International Code Council) approved. 866/336-2568; www.perma-liner.com, Expo booth 1186.

PIPE, MANHOLE REPAIR

20 Pow-R Mole Sales LLC

The PD-22 service line replacement tool from Pow-R Mole Sales LLC is designed to split and replace existing lead, copper and plastic service lines from 3/4 to 2 inches in diameter, while reducing road and landscape restoration costs and eliminating the need for

large excavation equipment. The single-person operated machine features a compact modular design, allowing access to most locations. The 7 hp portable hydraulic unit has a non-slip cylinder-activated jaw with 7 tons of pull force, out-of-pit controls and wheeled valve cart. The system is offered in a package that includes 75 feet of 3/8-inch wire rope, 3/4- to 1-inch splitter head, pipe grip, machine gate extension and pipe gripper plate. 800/344-6653; www.powrmole.com, Expo booth 9203.

21 TRIC Tools Inc.

The X30 lateral bursting unit from TRIC Tools Inc. features 30 tons of pulling force in an 80-pound unit. The system offers an extra margin of strength for bursting pipes 6 inches in diameter and less. The unit is available with an 80-pound, heavy-duty pulley base or 50-pound standard resistance plate. 888/883-8742; www.trictools.com, Expo booth 103.

22 Infratech Infrastructure Technologies Inc.

The MONOFORM ABS interior manhole forming system from Infratech Infrastructure Technologies Inc. is designed for the pouring of new concrete walls and bases for complete rehabilitation of existing manhole structures. Engineered to exceed H-20 traffic loading requirements, restoration is completed without traffic detours, external sewage bypassing and disruption to adjacent utilities. Custom forms are available for larger structures, including lift station rehab or retrofit. 800/533-4244; www.infratechonline.com, Expo booth 9059.

23 Avanti International

AV-100 chemical grout from Avanti International is an ultra-low viscosity, chemically activated gel, available in either powder or liquid. Having the same viscosity as water, the grout quickly permeates the substrate and cures to form a matrix with the soil and porous rock, creating a long-lasting water barrier and soil stabilizer. It has been used in probe grouting, remote packer grouting, curtain

grouting and tube-a-machete grouting for pre-excavation groundwater control, hazardous waste encapsulation, the prevention of structural movement due to groundwater, as well as sealing entire sewer systems and underground transit systems. 800/877-2570; www.avantigrout.com, Expo booth 7136.

24 Parson Environmental Products Inc.

Seal-Tite two-component, moisture-insensitive, fast-reacting polyurethane grout from Parson Environmental Products Inc. is designed to stop active leaks up to 50 gpm in manholes, pump stations and other wastewater structures. The chemically resistant formula cures to a dense, rigid mass in approximately 30 seconds. The sealant is packaged in a dual cartridge with static mixer and is injected at or near the source of the leak using a manual, dual-compartment caulk gun. The product contains no solvents, CFCs or HFCs. 800/356-9023; www.parsonenvironmental.com, Expo booth 6075.

25 Sealing Systems Inc.

Flex-Seal Utility Sealant from Sealing Systems Inc. is a plural component aromatic urethane, featuring 800 percent elongation and tensile strength of 3,200 psi. The sealant is designed to prevent inflow/infiltration and provide corrosion protection at the grade adjustment ring or joint section, as well as provide protection from hydrogen sulfide and salt. The internal seal is manually applied using a paintbrush. The kit is made to cover 12 vertical inches on a 27-inch diameter manhole. The sealant meets ASTM vacuum test standards. 800/478-2054; www.ssisealingsystems.com, Expo booth 165.

26 Madewell Products Corp.

The PortaMortar application machine from Madewell Products Corp. mixes, pumps and sprays high-build restoration mortar and 100 percent solids epoxy coatings in difficult-to-reach areas using the hydraulic power available on most skid-steer loaders. 770/856-4470; www.madewell.net, Expo booth 9208.



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27 Vaporooter

The Jet Set Commander applicator from Vaporooter is designed for the application of Sanafoam Vaporooter II, a chemical root-control product formulated to eliminate roots and resulting blockages in sewer systems. The applicator can be installed on most hydrojetters or combination sewer cleaning trucks with front-, mid- or rear-mounted reel. It can be easily removed when not in use and can be installed on a standard receiver hitch or chassis in place of a toolbox. The applicator can be factory installed or added as an after-market option. 816/781-4250; www.vaporooter.com, Expo booth 4126.

28 PipeLogix Inc.

The re-branded PIPELOGIX Version 6.4 (formerly flexidata) survey software from PipeLogix Inc. features formats from NASSCO for LACP, PACP and the revamped MACP with inspection level 1 and 2. The 3D Measurement Tool in the 360 Manhole Module enables users to select, outline and measure pipe connecting to the manhole as well as cracks or other conditions. The colored graphic and measurements can be turned on or off in the 360 Viewer, allowing a picture of the displayed graphic with measurement to be saved as a report that can be shared. 866/299-3150; www.pipelogix.com, Expo booth 158.

29 Mainline Backflow Products Inc.

The Adapt-a-Valve inspection chamber from Mainline Backflow Products Inc. is typically installed at the municipal property line. The chamber features an optional "open-gate" or "closed-gate" design and has a "test gate" that can be used for pressure testing during installation or to isolate property for pressure cleaning or non-payment of services. The chamber comes with 4-inch gasketed ends with 8-inch riser and constructed to SDR26, heavy-wall PVC sewer specifications. The optional lightweight gates offer little to no flow restrictions, but can withstand 50 psi backpressure. Options include a cap and collar for the inspection chamber. Caps come in red,

green or blue to help differentiate service lines. The caps also have a locking nut and pressure-reducing screw for safer maintenance. 780/413-7204; www.backwatervalue.com, Expo booth 7070.

JETTERS

30 Spartan Tool LLC

The Ultimate Warrior trailer jetter from Spartan Tool LLC is designed to deliver 4,000 psi and 18 gpm of water for cleaning pipes up to 24 inches in diameter. Compliant with National Association of Trailer Manufacturers standards, the fully enclosed jetter is powered by an 84 hp Kubota engine and features a Giant brand pump and 600-gallon water tank. 888/876-2371; www.spartantool.com, Expo booth 1170.

31 Cam Spray

The STB2712H waterjetter from Cam Spray produces 12 gpm at 2,700 psi. Powered by a 27 hp Honda engine, features include powder-coated, full-metal deck trailer with road-ready lights and brakes, 300-gallon water tank with auto shutoff, 400 feet of 1/2-inch hose on a DC-powered reel with remote foot switch, 150 feet of garden hose and 2-inch hydrant fill. Available models include 7 gpm at 4,000 psi, 8 gpm at 3,700 psi and 12 gpm at 2,700 psi. 800/648-5011; www.camspray.com, Expo booth 3069.

32 John Bean Sprayers/Durand-Wayland Inc.

The model 7030D trailer jetter from John Bean Sprayers/Durand-Wayland Inc. delivers 40 gpm at 3,000 psi. Powered by a 99 hp Kubota turbo-diesel engine, the jetter features a Bean L1114SC pump. Designed for larger stormwater and sewer pipes, options include a dual hose reel for smaller applications. 800/241-2308; www.johnbeansprayers.com, Expo booth 2017.

33 Draincables Direct

The Electric Portable Jetter from Draincables Direct features a triplex plunger pump with ceramic plungers and stainless steel valves, 35-foot cord with GFCI, 100 feet of 1/4-inch drain hose and 50 feet of 1/8-inch trap hose with laser nozzle. Also included are removable reel with shutoff valve, toolbox, gloves, goggles, nozzle assortment and nozzle cleaning tool. 800/421-4580; www.draincables.com, Expo booth 4118.

34 Waterblasting Technologies

The HT100 Hand Hog hydraulically actuated coating removal gun from Waterblasting Technologies is designed for surface work on boats, structure tanks, building and industrial applications. Featuring an operating pressure of 40,000 psi, the 14-pound gun can be used to strip walls, signs or curbs. Available in 24-, 36- and 48-inch models, its length and two-step trigger mechanism keep the user at a safe distance during operation. Made of aluminum and stainless steel, the gun runs multiple head and nozzle configurations, offers a cutting path of 0-4 inches and has a cleaning capacity of 50-400 square feet per hour. 877/964-7312; www.waterblastingtechnologies.com, Expo booth 3147.

35 Gamajet Cleaning Systems

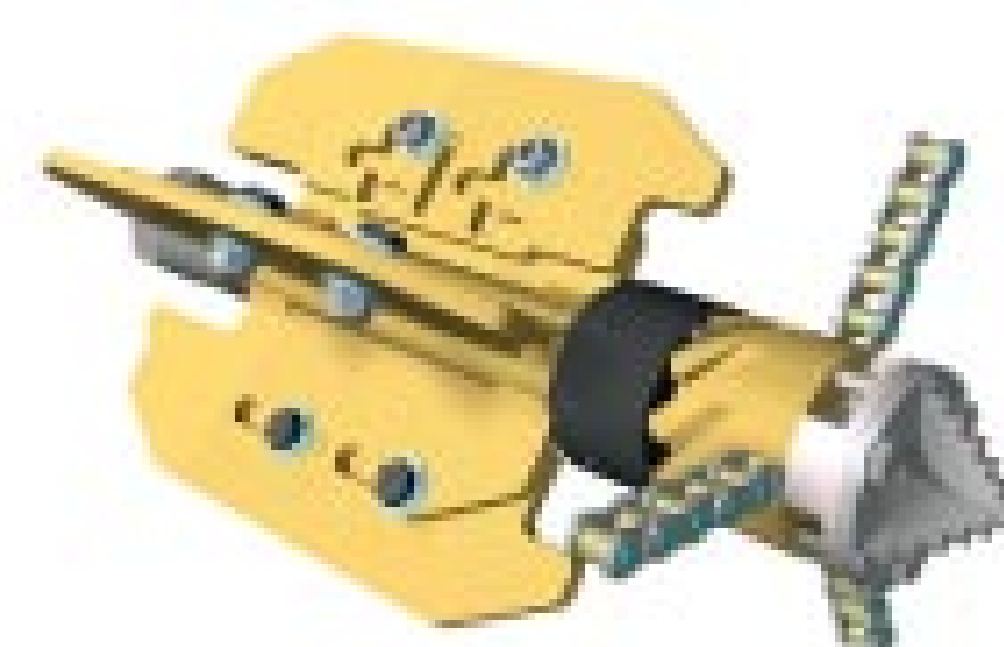
The E-28 rotary impingement tank cleaner from Gamajet Cleaning Systems, made to be used with a jetter truck or Gamajet Goby Jet portable pump system, is designed to clean wetwells, lift stations and large tanks. The automated tank-cleaning machine produces high-powered cleaning jets to scour the inside of a vessel in a 360-degree repeatable pattern, emulsifying grease from inside the container. The machine is fluid-driven and eliminates the need for confined-space entry. 610/408-9940; www.gamajet.com, Expo booth 6161.



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REELS, HOSES

36 Hannay Reels Inc.

The direct-drive, hydraulic-motor sewer cleaning hose reel from Hannay Reels Inc. is designed for precise hose payout. The reel has a capacity of 400 feet of 1-inch I.D. hose and features a swinging hose guide arm with roller and operator handle. An external hose connection allows users to tighten the hose connection without removing all the hose from the spool. A heavy-duty ball-bearing swivel base is available for added maneuverability. 877/467-3357; www.hannay.com, Expo booth 3161.

37 Reelcraft Industries Inc.

The DP7000 Series dual-pedestal reel from Reelcraft Industries Inc. features a two-piece, non-welded, interlocking base. Other features include steel-formed and stamped-base design for strong, compact assembly and vibration resistance. Reels are available with up to 50 feet of 1/2-inch I.D. hose. 800/444-3134; www.reelcraft.com, Expo booth 7128.

38 Piranha Hose Products Inc.

Slither jetting hoses from Piranha Hose Products Inc. feature an ultraslick cover that enables the hose to snake around and through difficult bends in residential and industrial sewer applications. The hoses are available in Series SLSPOR orange, 2,500 psi, I.D. sizes 5/8 to 1 1/2 inches; Series SLLBU blue, 3,000 psi, I.D. size 1/2 inch, and Series SLHPBU blue, 3,000 psi, I.D. sizes 3/4 to 1 inch. Also available are Series SLGR green, 4,000 psi, I.D. sizes 1/8 to 1/2 inch; black 4,000 psi Series SLSHBK in 1/2- and 5/8-inch I.D. sizes; Series SLLHBK in 1/2-inch I.D. and Series SLRD red, 5,000 psi in 1/4-, 3/8- and 1/2-inch I.D. Hoses 1/8, 3/16, 1/4, 5/16 and 3/8 inches have a temperature rating of 160 degrees F. Hoses 1/2, 5/8, 3/4 and 1 inches have a rating of 150 degrees F. 800/250-5132; www.piranhahose.com, Expo booth 6123.

NOZZLES, PUMPS

39 Bowman Tool Company & Systems

The Dominator 430 lateral reinstatement cutter from Bowman Tool Company & Systems is designed to work in pipe as small as 6 inches in diameter. Machines are made from a solid billet of stainless steel. The cutter has an insulated internal air channel rather than an outside air tube. The motors are isolated in a water-tight chamber. The cutter's eight-moving-part design enables it to be disassembled and reassembled in approximately 30 minutes. 717/432-1403, www.bowmantool.com, Expo booth 9318.

40 ENZ USA Inc.

The 10.125TR/10.125TR-US turbine-driven rooter cutter nozzle from ENZ USA Inc. can be used with both clean and recycled water in 5- through 12-inch pipes. The nozzle also can remove grease, solid and semi-solid sediments, mineral deposits, concrete, grout wash and other debris. A variety of attachments are available. The nozzle requires a 3/4- or 1-inch hose connection and is available on a larger skid body with 6- to 10-inch extension skids. 630/692-7880; www.enzusainc.com, Expo booth 67.

41 Gardner Denver Inc.

HC Inline Fluid Ends from Gardner Denver Inc. are designed to save time and parts costs by quickly converting from 10,000 to 15,000 to 20,000 psi without changing valve sets or stuffing boxes, and without relaxing torque bolts. Four plunger sizes allow for flows from 10 to 52 gpm. The ends utilize the same valve sets and stuffing boxes for each pressure range. Changes require little training and can be made in the field by an operator. The ends are available for 600 hp quintuplex pumps as well as 300 and 330 hp triplex pumps. 800/231-3628; www.waterjetting.com, Expo booth 137.

42 NozzTeq Inc.

The BL SWIPER sewer nozzle from NozzTeq Inc. features a green poly exterior shell and stainless steel internal tubes that loop the water along air channels, increasing airflow and jet stream length inside the pipe. The nozzle is designed for 12- to 36-inch pipes. A smaller version for 8- to 18-inch pipes is available. 866/620-5915; www.nozzteq.com, Expo booth 8181.

43 USB-Sewer Equipment Corp.

High-quality sewer cleaning nozzles with Optimized 3D Hydro Mechanics from USB-Sewer Equipment Corp. are precision engineered according to DIN EN 9001:2000 standards. Water from the pressurized hose is diverted by a cone piece and guided into the hydro channels, preventing turbulence in the nozzle chamber. The nozzles are manufactured in one piece under Tier 4 standards. 770/984-8880; www.usbsec.com, Expo booth 51.

44 Cat Pumps

High-performance SCP5140 triplex plunger pumps from Cat Pumps offer enhanced cleaning on the SCP frame. Rated at 5.5 gpm, 3,500 psi and 1,500 rpm, the compact pump is designed for the small space requirements of hydraulic-drive, truck-mount cleaning systems, gas gearbox direct-mount systems, conventional belt-drive systems or portable jetting units. Features include forge brass manifold and V-Packing high-pressure seal. Models include SCP5140 pump, SCP5140G1 pump with gearbox, SHYD5140 pump with hydraulic motor, base and accessories, and SCP5140J pump with Mag-Jet jetting valve. 763/780-5440; www.catpumps.com, Expo booth 4068.

45 Thompson Pump

The Compact pump series from Thompson Pump is 35 percent smaller and 20 percent lighter than its JSC series pumps. With a 24-hour run-time fuel tank, the diesel-drive pumps are available in 4- and 6-inch sizes and feature the Enviroprime system that keeps



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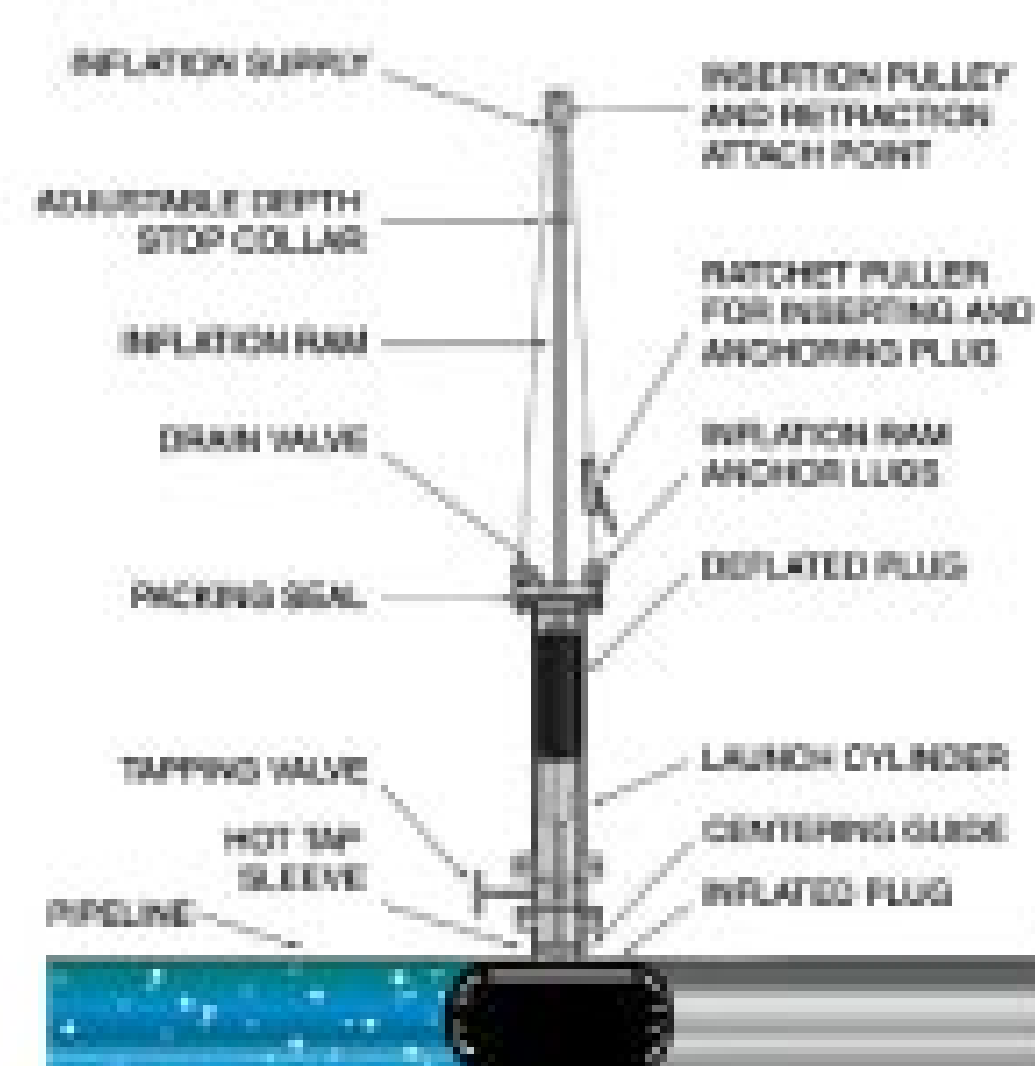
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pumped materials from discharging into the environment. Other features include automatic start/stop and Silent Knight sound attenuation. 386/767-7310; www.thompsonpump.com, Expo booth 8139.

TUBE CLEANING

46 StoneAge Inc.
The Banshee cleaning tool from StoneAge Inc. is designed to clean tubes from 1/2-inch to 2-inch I.D. The straight-flow-designed tube cleaner delivers 2,000 to 40,000 psi. Maintenance-free, the nozzle uses high-pressure water as a liquid bearing, eliminating the need for seals, oils or ball bearings. Replaceable head options include unplugging, polisher, universal and custom. 970/259-2869; www.stoneagetools.com, Expo booth 4133.

47 NLB Corp.
The wireless X-Y Safflex 2000 control system from NLB Corp. enables the operator to locate two high-pressure lances and index them into and out of a tube bundle and start and stop the flow of high-pressure water. The system is designed to drive hoses with an O.D. range of 7 to 15 mm at pressures to 40,000 psi. Switching from one hose to another can be done by opening the clamshell enclosure, removing one set of hoses, installing a new set and replacing hose stops and wipers. The control system includes transmitter and receiver with rechargeable battery pack that can run 12 hours under normal operating conditions. 248/624-5555; www.nlbcorp.com, Expo booth 7095.

48 Advanced Pressure Systems
The "Chicken Wing" Articulated Flex Lance Safety Stop from Advanced Safety Systems is designed to handle backwash for safer pipe cleaning. The lance stop/anti-withdrawal device attaches to any size tube sheet and is readily adaptable to vertical or horizontal applications. The safety stop is made of zinc-plated steel with steel

handles, anodized aluminum housing and Lexan splashguard. A quick-change insert provides stops for six sizes of lances. 281/290-9950; www.advancedpressuresystems.com, Expo booth 3019.

PLUGS

49 Logiball Inc.
Securimax multisize, reinforced plugs for line acceptance testing, flow-through plugs for bypass pumping or flow diversion and flexible push plugs for laterals from Logiball Inc. are made with multiple piles of reinforcement and factory tested at pressures equivalent to twice the maximum recommended inflation. Plugs come with anchoring devices, and if damaged, can be factory re-sleeved. 800/246-5988; www.logiball.com, Expo booth 7114.

50 Vanderlans and Sons Inc.
Lansas Multisize Interchange plugs from Vanderlans and Sons Inc. are designed to keep work flowing and manholes dry during rehabilitation. The bypasses can be quickly changed to connect to a rigid pipe using the supplied flanged or NPT ends or optional Super-Flow ends for flexible hose. Plugs are available from 4 to 24 inches in diameter. Custom and single-size plugs are available. 800/452-4902; www.lansas.com, Expo booth 37.

51 Petersen Products Co.
The Inflatable Line Stop Plug from Petersen Products Co. is designed to plug a pressurized pipeline. The plug is installed by attaching a tapping sleeve, full-port valve and making a tap. The Line Stop Plug Launch Cylinder is attached to the tapping valve and opened to equalize pressure. The plug is then pushed into place and inflated. 262/692-2416; www.pipeplug.com, Expo booth 4136.

52 Savatech Corp.
High-performance pneumatic blocking and bypass pipe plugs from Savatech Corp. are made from rubber reinforced with Kevlar cord for extra strength. The plugs offer multi-functional usage and greater inflation pressure for higher backpressure conditions. Designed for flow stopping, bypassing and pipe testing in pipes from 4 through 96 inches in diameter, bypass flow plugs with multiple options are available. 386/760-0706; www.savatech.com, Expo booth 9037.

SOLIDS MANAGEMENT

53 Canplas LLC
The Endura Solids Interceptor from Canplas LLC features a dual-screen design and solid-walled container engineered to remove 98 percent of typical kitchen-generated solids in flow rates up to 50 gpm. The unit is designed to be installed directly in the compact platform interceptor body for stand-alone solids management. As an accessory, it can be fitted in the inlet baffle of full-height Endura Interceptors to provide a combination unit where installation space is restricted. 800/461-1771; www.canplasplumbing.com, Expo booth 9256.

54 Roebic Laboratories Inc.
Prepackaged RoeTech concentrated grease trap treatment from Roebic Laboratories Inc. is made to biologically break down fats, oils and grease into bacterial cells. The formula is made for safe use and contains no harsh chemicals. 203/795-1283; www.roebic.com, Expo booth 9158.



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55 Septic Drainer/Municipal Sales Inc.

The Mini-Foamer applicator from Septic Drainer/Municipal Sales is designed to use Bio-Septic Boost II, a bio-nutrient stimulant, to reduce grease, odors and hydrogen sulfide in grease traps, pump stations and collection lines. The foamer measures 17 inches wide, 42 inches high, 19 inches deep and weighs 75 pounds. It is available in 4- or 6-inch hose configurations. The unit includes foamer, hose/plug, uptake hose with inline strainer, 5-gallon solution container and steel-frame cart with 8-inch wheels. 518/747-2044; www.municipalsales.net, Expo booth 4052.

CABLE MACHINES

56 Duracable Manufacturing

The DM175 Upright Drain Machine from Duracable Manufacturing features 18-, 23- and 27-inch reels, 1/2 hp motor, direct-drive system, power cable feed and return, quick-release reel with swing bolts and polyethylene toolbox. Other features include three-position handle, continuous welded frame and stair climbers. 877/244-0556; www.duracable.com, Expo booth 3169.

57 Electric Eel Manufacturing Company Inc.

The Model Z5-P-AF drain cleaning machine from Electric Eel Manufacturing Company Inc. features an auto-cable feed that advances and retrieves cable with the push of a lever, while the cable guide spring keeps hands from the rotating cable for added safety. The unit's 100-foot, galvanized inner core cable is designed to clean 1 1/4- through 3-inch-diameter lines. Features include built-in drum shaft slip clutch, upright folding frame on 10-inch wheels and steel guide tube/inner drum. A rear bar shields the motor and allows for two-position operation. A 75-foot, 1/2-inch cable is standard. The drain cleaner also is available in manual feed. 800/833-1212; www.electriceel.com, Expo booth 169.

TRUCKS, ACCESSORIES

58 GapVax Inc.

The HV-56 high dump hydroexcavator option from GapVax Inc. enables wet or dry debris to be off-loaded on the jobsite into a 60-inch tall open roll-off container for disposal. 814/535-6766; www.gapvax.com, Expo booth 1022.

59 Hi-Vac Corp.

The B10 Aquatech combination jet/vac truck from Hi-Vac Corp. features 800 feet of 1-inch hose on a rear-mounted reel for safety and ease of operation and triplex water pump, designed for uninterrupted water flow at rates from 65 to 125 gpm. Other features include a 360-degree top-loading rotating boom and Roots-type blower for airflow and vacuum. The single-engine design offers ease of maintenance and lower fuel consumption. The self-cleaning tanks are made of a non-corrosive material and engineered to rise with the debris body. The hydraulic rear door fully opens for discharge. Options include extended boom, higher flow jetting pumps, remote control, jet cam, high-lift discharge and dual hose reels. 800/752-2400; www.hi-vac.com, Expo booth 4115.

60 Gradall Industries Inc.

The Vacall AJV (AllJetVac) combination vacuum/jetting sewer cleaner system from Gradall Industries Inc. is easily customized and features 16- to 27-inch Hg vacuum pumps with a range of water pump sizes and options. The three-stage filtration system is designed for increased machine life, reduced maintenance and minimal noise. Front- and rear-mounted hose reels have a high-torque, direct-drive planetary gearbox and hydraulic cushion valve. The unit has a telescoping boom: 26 feet from the centerline of the chassis with 8-foot, 6-inch boom extension option. Other options include waterproof control panel with labeled wiring harness, tailgate and debris body safety props operated from ground level. 800/382-8302; www.vacallindustries.com, Expo booth 5171.

61 Vac-Con Inc.

The X-Cavator combination machine from Vac-Con Inc. is designed to locate and safely excavate around utilities. Other applications include pathing/daylighting, trenching, highway repairs and water and sewer repair. Available in single- and tandem-axle models, the unit features a three-stage centrifugal compressor, cyclone separator, hydrostatic drive, front-loading telescopic boom with pendant control, 270-degree rotating boom, 10 gpm/3,000 psi hydraulically driven water system, passenger-side controls, 100-foot retractable reel, full-opening rear door with hydraulic door locks and hydraulic door grabber. 904/284-4200; www.vac-con.com, Expo booth 1202.

62 Wastequip

The Mastervac combination vacuum truck from Cusco, a Wastequip company, is capable of handling both wet and dry materials, including heavy sludge, fly ash, as well as hazardous and non-hazardous applications. Equipped with cyclone/baghouse filtration technologies and airflow ratings of 2,500 cfm to 5,500 cfm, along with vacuum levels of 28 inches Hg, options include high-pressure wash system, stainless steel tank, hydraulic suction boom, HEPA filtration systems, heated valves and pressure unloading systems, storage cabinets/toolboxes, DOT 407/412 and TC 407/412 configuration. 800/490-3541; www.wastequip-cusco.com, Expo booth 2055.

63 VT Hackney Inc.

The P/2000 aluminum service body mounted on an Isuzu NPR diesel chassis from VT Hackney Inc. features a rear drop floor, three-step entrance, double swing-out barn-style rear doors and pull-out walk ramp for easier loading of heavy equipment. Custom built with a flexible interior that includes adjustable shelving on vertical tracks and slide-out plastic storage bins, the unit can be configured for general plumbing, drain cleaning or pipe lining. It can accommodate an enclosed jetter with the addition of a side roll-up door for hose reel access. 800/763-0700; www.hackneyservice.com, Expo booths 7174, 7175.

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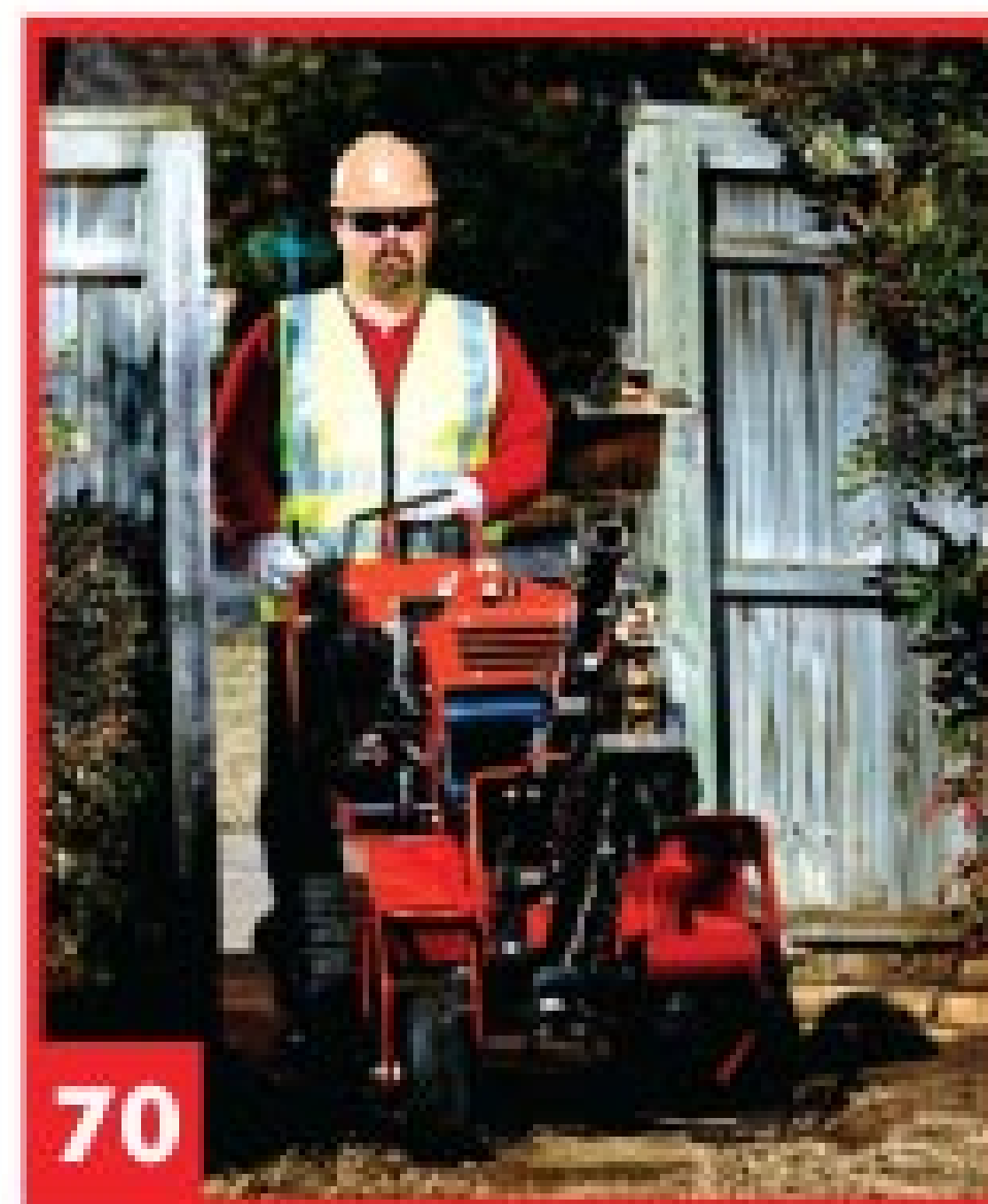
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FLITZ International Ltd.

The Heavy-Duty Truck Polishing Kit from FLITZ International is designed to remove oxidation, bluing, oil, diesel fuel stains and magnesium chloride/salt corrosion. The kit contains a 5.29-ounce tube of FLITZ metal, plastic, fiberglass and paint restorer polish, 7-inch Big Blue buff ball and Waxx protectant. 262/534-5898; www.flitz.com, Expo booth 31.

65

Williams Innovations LLC

The TeleSwivel 400 frame-mounted trailer hitch from Williams Innovations LLC features a 2.5-inch receiver box (2 inches with adapter sleeve). Made for medium- and heavy-duty truck frames with a 15,000 to 40,000 GTW tow capacity, the hitch eliminates the need for precise truck and trailer alignment by extending out and swiveling side-to-side, increasing the target zone by 25 times. The hitch also eliminates the need to "muscle" trailers into place and enables most drivers to attach a trailer in a single pass. 888/835-7948; www.teleswivel.com, Expo booth 7198.

Smoke candles for 30 seconds to three minutes for residential and commercial testing units are available. 800/945-8378; www.superiorsignal.com, Expo booth 6141.

68

BW Technologies by Honeywell

The GasAlert Max XT II portable four-gas detector from BW Technologies by Honeywell combines simple operation with an integrated, high-flow SmartSample sampling pump for reliable performance and protection in confined spaces and other hazardous areas. The unit features one-button operation, a go/no-go interface and automated compliance for fewer operational errors and reduced training time. The UL and CSA approved unit alerts users to carbon monoxide, hydrogen sulfide, oxygen levels, methane and other flammable gases. Compatible with the MicroDock II docking station, an automated test and calibration device are available as an accessory, it can be connected to a PC for greater control and as a safeguard for compliance concerns. Tamper-proof, user-adjustable options enable the gas detector to be customized for any application. 888/749-8878; www.gasmonitors.com, Expo booth 6147.

70

Ditch Witch

The RT23, 22.3 hp hydrostatic trencher from Ditch Witch is designed for electrical, plumbing and other aboveground construction professionals. The unit can dig trenches 48 inches deep and 8 inches wide. In difficult digging conditions, chain speed can be adjusted by substituting a 10-tooth sprocket for the standard 12-tooth chain. Features include hydraulic skid-steer-style steering and high-flotation tires. Heavy-duty tracks that oscillate 12 degrees can be added for stability and traction. 800/654-6481; www.ditchwitch.com, Expo booth 9048.

71

AlturnaMATS

Ground protection mats from AlturnaMATS are designed to protect landscapes and keep heavy equipment from becoming stuck in mud, sand or snow. The half-inch-thick mats are available in black or white with cleats on both sides, one side or smooth on both sides. Sizes range from 2 feet by 4 feet up to 4 feet by 8 feet. 888/544-6287; www.alturnamats.com, Expo booth 7102.

72

SVE Portable Roadway Systems Inc.

The TRAKMAT ground cover mat system from SVE Portable Roadway Systems Inc. is designed to protect lawns and golf courses from vehicle damage. Made of 100 percent recycled HD polyethylene, the light-green mat stays cooler in summer heat, protecting landscape from turf burn. Cleats on both sides provide vehicle traction. 800/762-8267; www.trakmats.com, Expo booth 6189.

LEAK DETECTION, SAFETY

66

Hurco Technologies Inc.

The PowerSmoker 2 leak detection system from Hurco Technologies Inc. utilizes indoor-safe and laboratory-tested LiquiSmoke to identify leaks in new plumbing construction prior to inspection and to locate sewer odors. The smoker leaves no residue or odor. All smoke is exhausted through the plumbing out the vent stack. 800/888-1436; www.gethurco.com, Expo booth 41.

67

Superior Signal Company Inc.

The SE electric smoker from Superior Signal Company Inc. is designed for hard-to-find leaks and odors. The unit weighs 8 pounds and is available in 110-volt AC or 12-volt DC. The smoker connects to any cleanout or vent and can be set up in minutes.

SERVICES, TRENCHERS, ACCESSORIES

69

A Corp/Rooter-Man/Sewer Equipment Company of America

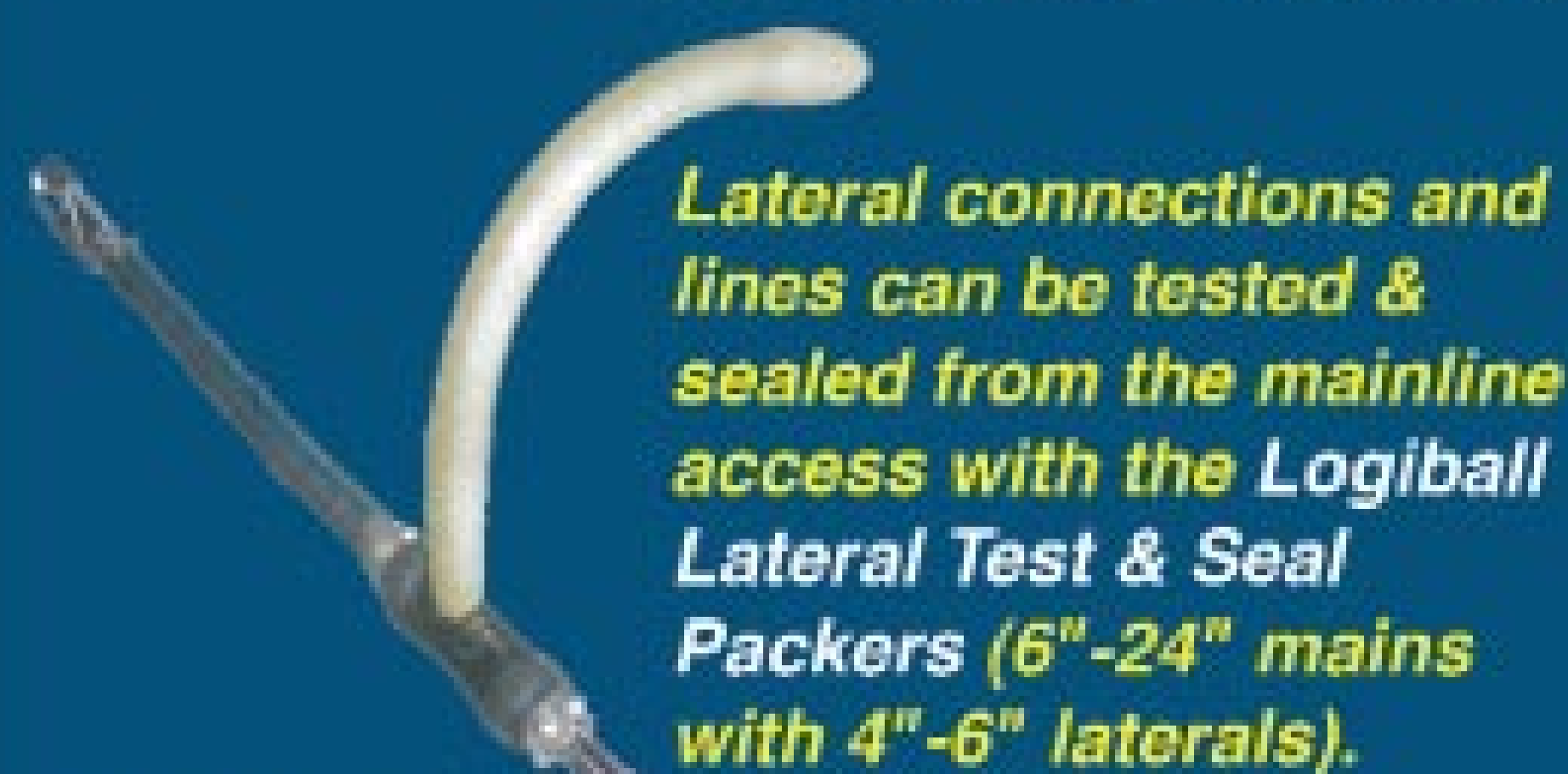
The Rooter-Man/Mongoose Business package from A Corp/Rooter-Man and Sewer Equipment Co. of America includes Rooter-Man franchise territory, Mongoose jetter, professional training and business manuals, ongoing support team and access to national buying programs. 800/700-8062; www.rootermanfranchise.com, Expo booths 9015, 9115, 4095.



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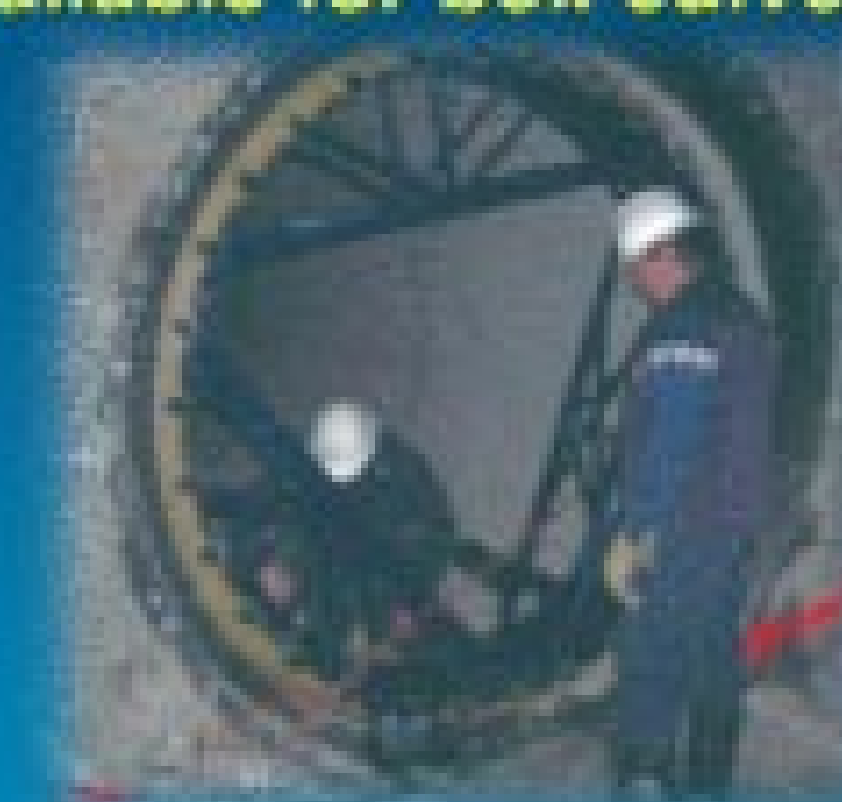
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Cleaning Surfaces

RESEARCH EXPLORES THE EFFECT OF A VARIETY OF PARAMETERS ON THE EFFECTIVENESS AND EFFICIENCY OF SURFACE PREPARATION USING HIGH-PRESSURE WATERJETS

BY DOUG WRIGHT, JOHN WOLGAMOTT AND GERALD ZINK

Waterjet surface preparation is typically performed using pressures from 20,000 to 40,000 psi with rotating nozzle heads varying from 2 inches to 16 inches in diameter. Materials removed include coatings, oxidation and scale.

But how do variables like standoff distance, traverse speed, surface speed, rotation speed, and head design affect the efficiency of material removal? Research looking at these variables using test specimens showed that feed rate had the greatest effect on performance and also directly affected efficiency. The next strongest parameter was the design of the jetting head.

STUDY BACKGROUND

A wide variety of equipment is available for waterjet surface preparation. Most equipment now includes rotating nozzle heads. Handheld rotating guns are the most basic tools, while self-propelled machines clean much wider paths at controlled feed rates.



Figure 1. Arrangement consisting of a rotating head and traversing mechanism. (Photos courtesy of StoneAge Inc.)

Variables including standoff distance, rotation speed, feed rate, and nozzle head design all affect jet performance and cleaning efficiency in surface preparation. Previous studies have focused on massive material removal at lower pressures and higher flow rates, but questions have been asked on whether these results apply at higher pressures and to the removal of thin coatings.

Tests were performed using an air-powered rotating assembly that allowed the use of various heads. The assembly was attached to a tra-

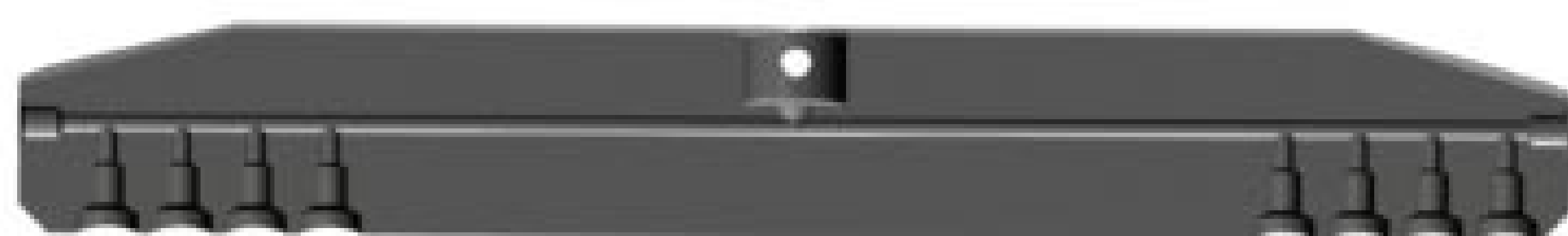


Figure 2. Bar head design

versing mechanism with adjustable feed rates (Figure 1). Test samples were placed underneath at an angle to vary the standoff distance from 0.37 to 3.5 inches.

Commercial-grade coated steel siding trim sections were used as test samples. Effectiveness was rated by visually estimating the percentage removal of the top coating and primer. All tests were run at 35,000 psi with flows of 3 to 6 gpm. Jet path diameters of 3.6, 8.4, 12 and 14.4 inches were used with rotation speeds from 500 to 3,200 rpm.

In addition to different path diameters, two general head types were compared: a one-piece bar type (Figure 2) and a multiple-piece head with individual bent jet arms (Figure 3). The bar heads had each jet ports spaced 0.37 inch apart. The diameters given above are the largest of the jet paths.

The majority of the tests were conducted using four 0.020-inch- or four 0.015-inch-diameter sapphire orifices. Jet angles exiting the bar head and the quantity of jets were also compared.

STANDOFF DISTANCE

The majority of the tests were conducted with the test sample placed at an angle to produce a varying standoff distance. The predominant observation was that the jets were ineffective in removing the coating when the standoff distance was too small. Every test showed this to some degree. The region of ineffectiveness is attributed to the jet still being coherent and not yet having broken into droplets.

The other measurable effect of standoff distance occurred in relation to rotation speed – in particular the effect of standoff distance relative to multiples of orifice diameter at two rotation speeds. The maximum “too close” range varied from 0.5 to 0.63 inches with the bar head, but increased to as much as 1 inch with the bent-arm head.

In terms of multiples of nozzle diameters, this range varied from 18 to 42 times the orifice diameter for the bar heads and up to 67 times the orifice diameter for the bent arms. The most effective removal with the bar head occurred beyond 65 to 95 times the orifice diameter. In the fastest rotation speed tests, the jet effectiveness showed rapid deterioration beyond 150 to 160 times the orifice diameter.

Slower rotation speeds allowed effective removal out to 230 times the orifice diameter, which was the longest standoff distance tested. No deterioration at the maximum distance was observed using the bent arms at the fastest rotation speed tested.

ROTATION SPEED

The rotation speed tests were designed to determine whether there is a rotation speed at which jets begin to lose power. The diameter of the jet path affects the velocity at which the nozzle tip is moving. A jet path diameter of 3.6 inches rotating at 3,000 rpm results in a velocity of 47 feet per second, while a jet path diameter of 14.4 inches rotating at 1,800 rpm results in a velocity of 113 feet per second.

Therefore, it is expected that as the jet path diameter increases, the rotation speed should be slowed to maintain an effective velocity.

Four parameters varied the effect of rotation speed on performance: standoff



Figure 3. Bent-arm design

distance, orifice diameter, feed rate and head design. Increasing rotation speed with increasing standoff distance narrowed the effective standoff distance range.

The jet performance with increasing rotation speed deteriorated faster with a smaller orifice diameter. The effects of rotation speed made a slight difference as the linear feed rate was increased. Faster feed rate showed improvement with increasing rotation speed up to a point before performance began to decrease.

Rotation speed was tested at three jet path diameters. The 14.4-inch bar head was tested at 500, 1,000 and 1,800 rpm. The 8.4-inch head was tested at 1,000, 1,500 and 2,000 rpm, and the 3.6-inch head was tested at 2,000 and 3,200 rpm.

The feed rates were adjusted to produce the same rate of coverage; therefore the 3.6-inch head was advanced at a rate four times that of the 14.4-inch head. For the head diameters and speeds tested, the results fell on approximately the same curve, and deterioration in jet power began to occur at a velocity greater than 66 feet per second.

FEED RATE

These tests showed the feed rate to have the greatest effect of all the parameters on percentage of coating removal. The 14.4-inch bar head was tested with rotation speeds of 500, 1,000 and 1,800 rpm at feed rates of 20, 30 and 40 inches per minute. Optimum efficiency occurred at 1,000 rpm and 30 inches per minute. The 8.4-inch bar head was tested with rotation speeds of 1,000, 1,500 and 2,000 rpm at feed rates of 40 and 60 inches per minute. The best performance was at 2,000 rpm and 60 inches per minute.

The 3.6-inch bar head was tested with 2,000 and 3,000 rpm at 80 and 120 inches per minute, and the best performance occurred at 2,000 rpm and 120 inches per minute.

JET PATH DIAMETER

The efficiency of jet path diameter based on the bar heads was also tested. For the three to be equally efficient, the 3.6-inch-diameter head theoretically needed to have an effective feed rate three times that of the 14.4-inch head, and that held true.

The greatest efficiency appeared with the 8.4-inch head – it produced a cleaner pass than either of the two other heads, at a feed rate of twice that of the 14.4-inch head.

The sensitivity of the larger head's diameter curve may be another contributing factor in head diameter selection. The efficiencies of these heads are not too far apart, but if the trend were to continue beyond the diameters tested, one would expect a further loss of efficiency.

The theoretical feed rate can be calculated based on the number of jets traveling in the same path, the orifice diameter of the jets, and the rotation speed. This does not take into account the head diameter. The ratio of the actual feed rate to the theoretical feed rate for the optimum efficiency varied from 1.5 times for the largest bar head to three times for the smallest.

JET ANGLE

A 14.4-inch bar head with 5-degree outward-angled ports was compared to a 14.4-inch bar head with straight downward-facing ports. The angled ports removed about 15 to 20 percent more coating than the straight ports.

BENT-ARM HEAD DESIGN

The bent-arm head design was tested and compared to the bar head design. The greatest effect occurred with standoff distance. The bent-arm head showed less deterioration due to rotation speed rate as well, and the efficiency of coating removal compared to the bar head improved by 25 to 30 percent.

Nearly the same removal was achieved with the 0.015-inch orifice size in the bent arms as that achieved by the 0.020-inch orifice size in the bar head. Further testing would be required to determine if this improved efficiency of the bent-arm design could be translated directly into increased production rates.

CONCLUSIONS

The relative effects of standoff distance, rotation speed, feed rate, and head design were measured and compared in these tests. Overall, the parameter having the greatest effect on performance was the feed rate, which also directly affects efficiency.

The next strongest parameter was the head design – the bent-arm head performance was 25 percent better than that of the bar head design, and jet angle improved performance by 15 percent.

Jet path diameter appeared to reach an optimum around the 8.3-inch size range, although this was not a strong influence. Rotation speed affected performance in several ways, none being very influential.

These tests showed that increasing rotation speed is not necessarily a direct path to allowing a faster feed rate; it should be kept within a range to produce a velocity between 33 and 82 feet per second for optimum performance. ■

ABOUT THE AUTHORS Doug Wright is an engineer, John Wolgamott is president, and Gerald Zink is vice president and chief engineer with StoneAge, Inc., in Durango, Colo. They can be reached at 970/259-2869.

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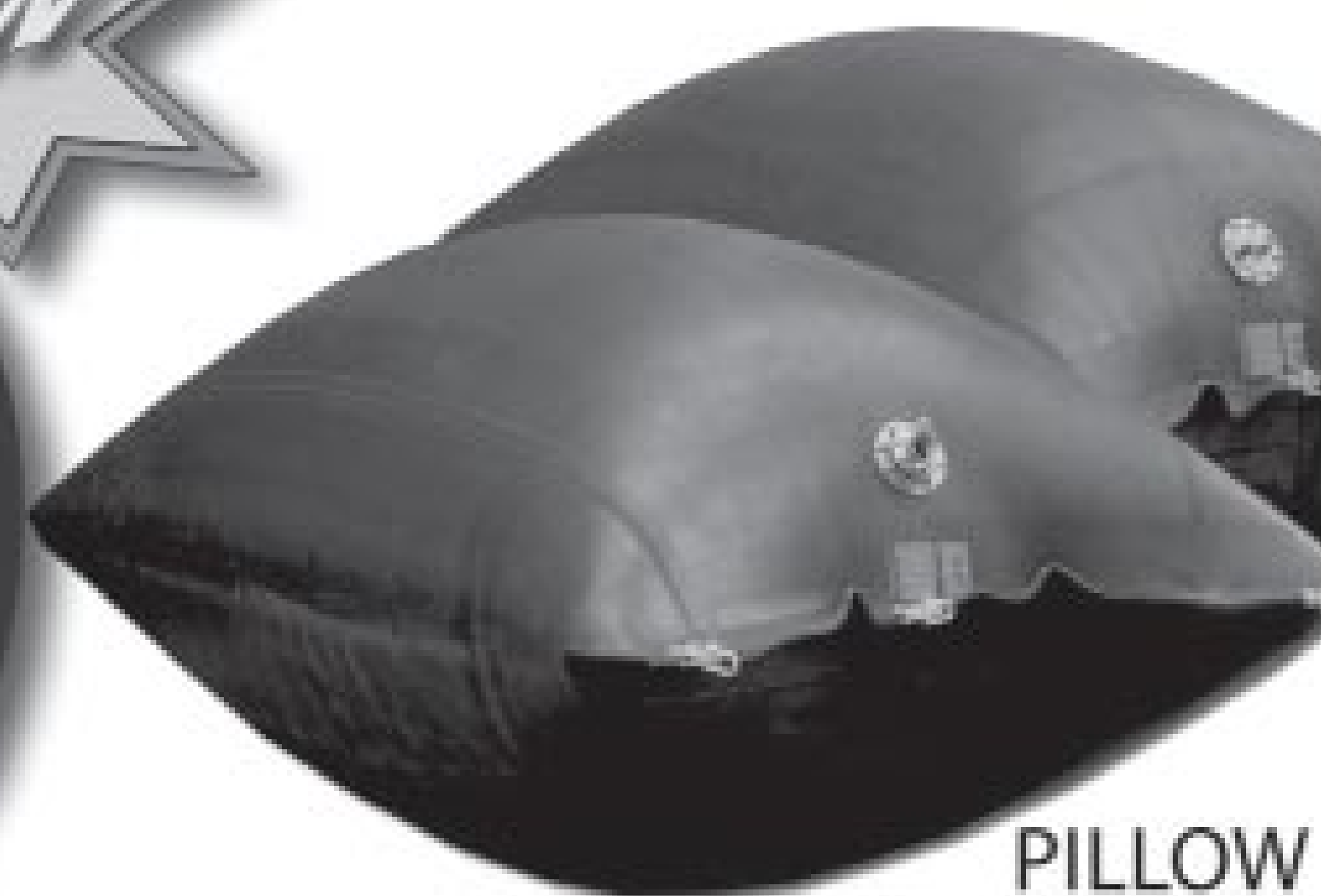
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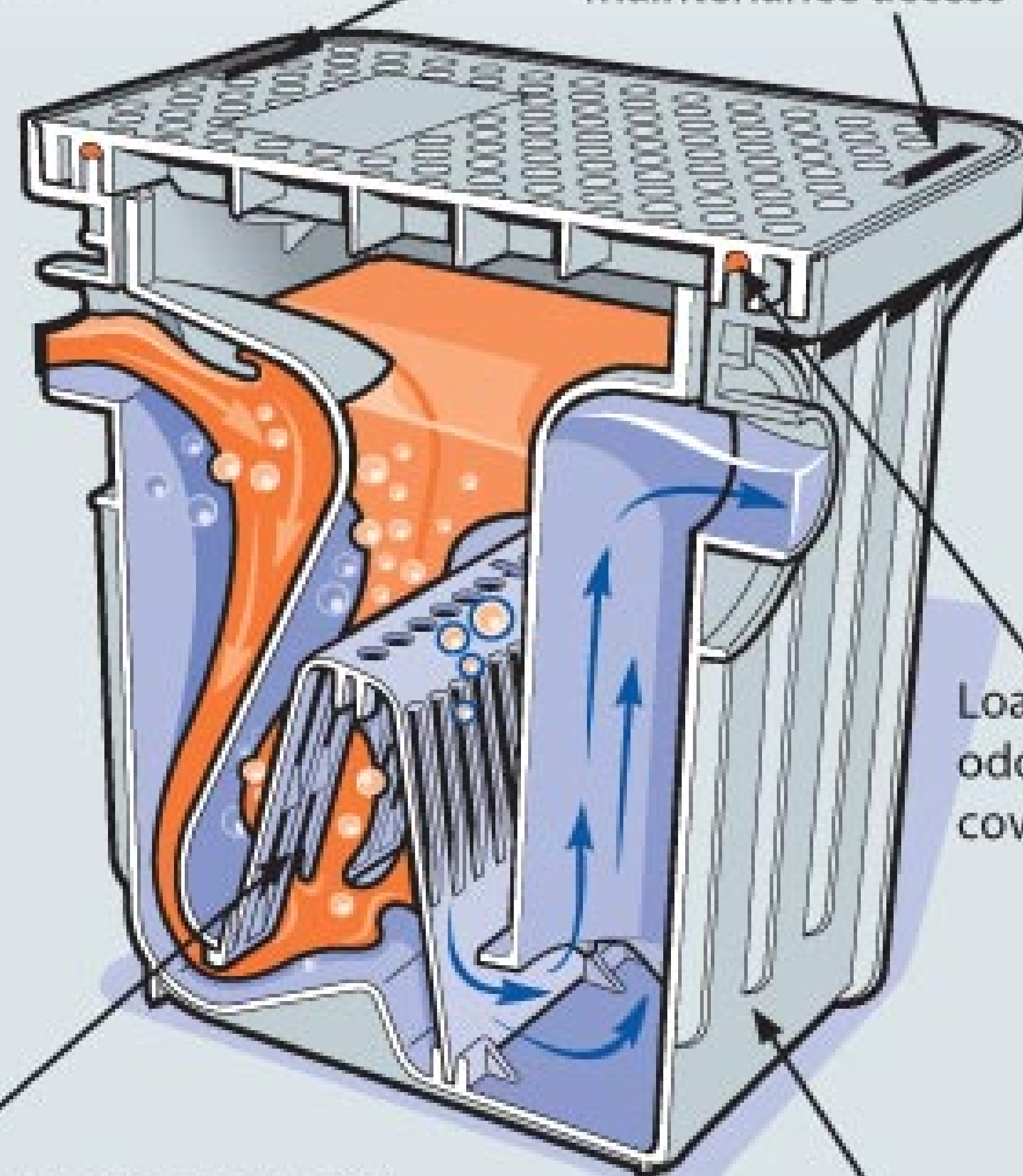
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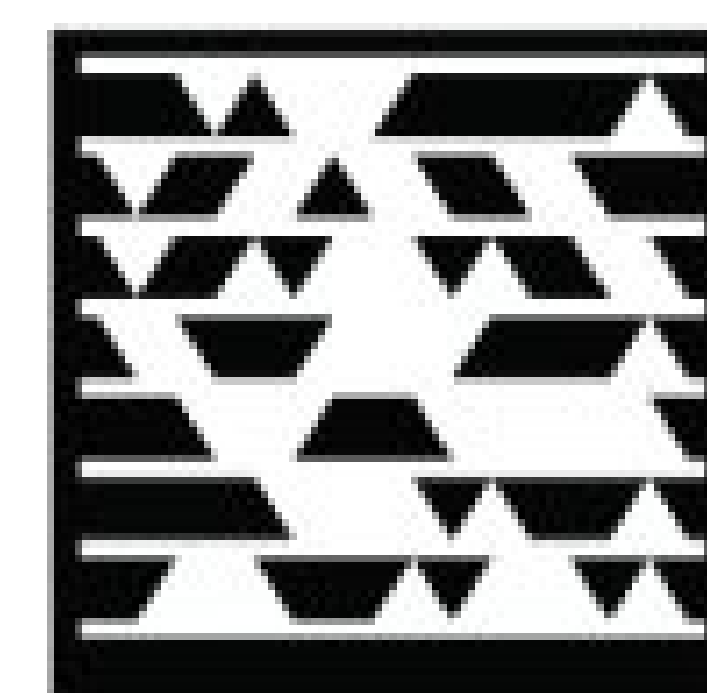
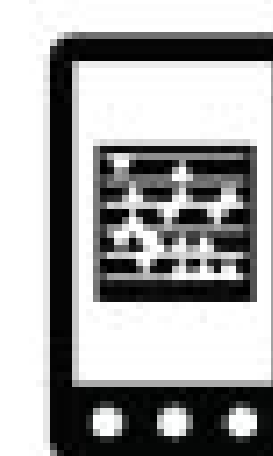
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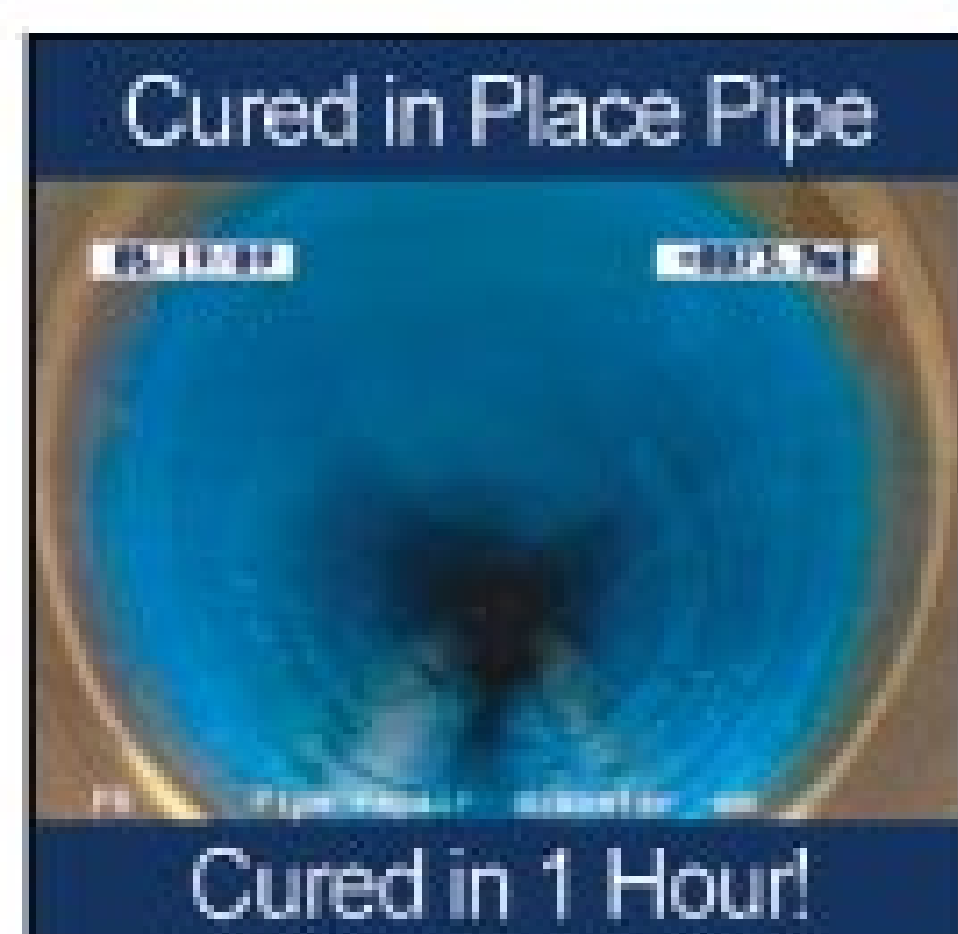
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Keeping What You Have

IF YOU ACQUIRED CORPORATION OR LLC STATUS, THERE ARE STEPS YOU NEED TO TAKE TO MAKE SURE YOU SAFEGUARD YOUR BUSINESS ENTITY

BY FRED S. STEINGOLD



Fred S. Steingold practices law in Ann Arbor, Mich. He is the author of Legal Guide for Starting and Running a Small Business and The Employer's Legal Handbook, published by Nolo. Legal strategies may vary depending on the state in which you live and the specifics of your situation. See your lawyer for legal advice.

When Joe and Sue went into business, they decided to incorporate. The reason: they wanted to receive the legal benefits available only to a corporation or a limited liability company (LLC) and not to a partnership or sole proprietorship.

By incorporating, they created a separate legal entity that protected them from personal liability. If someone were to start a lawsuit because a business debt was unpaid, they wouldn't have to worry about their own personal assets – their homes, cars and bank accounts. Only the assets of their business, J&S Enterprises Inc., would be at risk.

or LLC, you must carefully maintain that separate-ness. You must always make it clear that you're conducting business as an agent of the corporation and not as an individual. These pointers are worth keeping in mind:

Business name. Use the full and correct name of your corporation or LLC in correspondence and contracts. If your corporate name is J&S Enterprises Inc., don't leave out the "Inc." unless you've filed an assumed name or fictitious name certificate with the appropriate governmental authorities.

Banking. Maintain a separate bank account for your corporation or LLC. Have the company's

written contract. In the case of a corporation, have the board adopt a resolution approving this action.

Taxes. Make sure your company pays federal and state withholding taxes promptly. Officers, directors and principal employees of closely held companies may be personally liable for payment of withheld taxes if the company runs out of funds to pay these obligations.

Records. Keep your company record book up to date. If your business is a corporation, write up minutes or resolutions at least annually for shareholders and directors.

Co-signing. If your company borrows money

It's amazing how many business people go to the trouble of establishing a corporation or LLC, but fail to follow up properly. They increase the risk that creditors and others may be able to pierce the corporate veil and seize the personal assets of the owners.

The same thing would be true if a customer were injured through an employee's negligence: only the corporation's assets would be exposed if there were a judgment for an accident not covered by insurance.

So it was a happy day when Joe and Sue left their lawyer's office with the Articles of Incorporation and corporate record book for their newly created company. Fortunately, their lawyer also gave them something equally valuable to take with them: some simple guidelines for preserving the benefits of incorporation.

It's amazing how many business people go to the trouble of establishing a corporation or LLC, but fail to follow up properly. They increase the risk that creditors and others may be able to pierce the corporate veil and seize the personal assets of the owners.

To help you avoid such problems, here are some suggestions for protecting your corporate or LLC status. Many of these suggestions are based on the principle that a corporation or LLC is a legal entity separate from its owners and employees. To enjoy the legal benefits of having a corporation

name printed on all checks. Be careful not to mix business funds with your own personal funds.

Signatures. Sign documents and letters as an officer of the company.

For example, a corporate contract should be signed this way:

J&S ENTERPRISES, INC., a Michigan corporation

By: (Signature)

Joseph Anderson, President

Property transfers. If a corporate shareholder or LLC member transfers property to your company, such as a computer or furniture, formally document the transfer by a bill of sale or an assignment.

Leases. If a shareholder leases a car, building or other property to your corporation, the board should approve the transaction, and a lease should be signed.

Loans. Sign promissory notes if you loan money to your corporation or LLC, or if you borrow money from it.

Employment. If a shareholder or member is to be hired by the corporation or LLC as an employee or an independent contractor, enter into a

from a bank and you're asked to co-sign a promissory note, be sure you fully understand the extent of your personal liability in case the company defaults.

Annual reports. File your annual report on time with the proper state authorities. Otherwise, you may face fines and even dissolution of your corporation or LLC.

S Corporation. If you elect S Corporation status for your corporation to avoid a corporate income tax, be aware that the election (IRS form 2553) must be filed by the 15th day of the third month of your tax year.

Insurance. Check with your insurance agent to make sure you have public liability coverage, not only for property owned by the company, but also for property leased to the company and for your own property, which may informally be used for company business.

With a little extra effort and a small amount of paperwork, you can help preserve the benefits for which you formed a corporation or LLC. **C**



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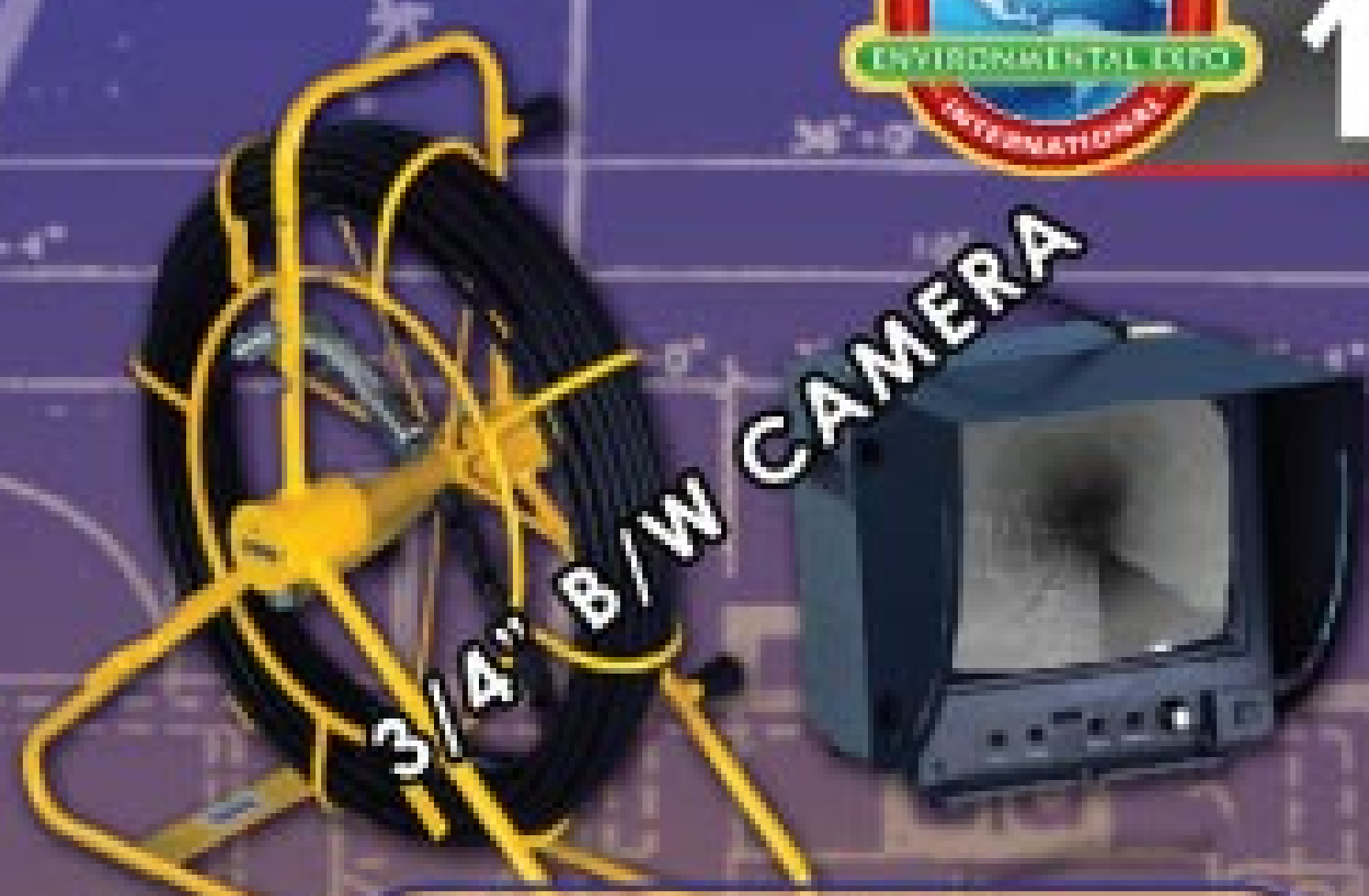


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To Boldly Go...

A COMPACT RUBBER-TRACKED EASEMENT JETTER HELPS A MAINE PIPELINE SERVICES COMPANY WORK IN TIGHT SPOTS AND REMOTE LOCATIONS

BY KEN WYSOCKY

Getting access to remote sewer interceptors that run along riverbanks in Maine used to be a real chore for workers at Ted Berry Co. Inc. in Livermore. That changed when the company bought an easement jetter with a 600-foot hose reel.

"For a combination truck to access these easements, which typically aren't very well maintained, we'd have to build a gravel road," says Matt Timberlake, vice president. "We did a job years ago with 12- and 14-inch oak trees growing in the easement. After that, we looked hard at how to approach these jobs faster and with less impact."

Timberlake's research turned up the TracHorse all-terrain carrier from Stanley Hydraulic Tools, a division of The Stanley Works. A self-propelled, compact carrier with 1,000-pound load capacity, the unit comes with a gasoline or diesel engine and uses hydraulic-powered rubber tracks to transport material and equipment. It runs a variety of tools that require water at up to 10 gpm/2,000 psi, supplied by a combination truck or a large waterjetter.

EASY TO OPERATE

The company bought its first TracHorse unit several years ago and recently bought another. It measures 80 inches long and 32 inches wide, can turn 360 degrees within its own length, and can traverse grades up to 60 percent. It has electric start, a top speed of 2 mph, a hydraulic-powered tilt bed, removable sides for flatbed use, and deadman control valves.

The operator walks behind the machine and operates it with two hand-control levers. "It's very similar to driving a skid-steer," Timberlake says. "On our older unit, we rigged a platform that the operator can stand on while driving."

While tiny compared to a combination truck, the machine delivers high productivity. Besides simplifying easement access, its maneuverability in tight industrial spots is a plus. "We have an industrial service division that does annual sewer cleanings at pulp and paper mills and hydroelectric plants," Timberlake says.

"We get maybe a 24- or 36-hour window, and the less time we spend trying to negotiate a big truck to a specific manhole, the better. The time saved varies, but it might take three hours to set up with a traditional truck, compared to half an hour with the TracHorse. With a 24-hour plant outage, every half-hour is extremely valuable."

"The machine is also much less intrusive to other contractors. We can set our big truck farther away from the work area and allow other contractors easier access."

BIG CLEANING JOBS

To clean multi-million-gallon clarifiers for compliance inspections at wastewater treatment plants, crews remove the reel. That takes about five minutes, thanks to four independent jacks, one on

each corner of the bed. Then workers attach a "deck gun," similar to a fire truck's water cannon. The pressure required to clean the clarifiers with a hose could easily "blow a guy over backwards," Timberlake says.

"When I first got out of high school, I was on one of these clarifier jobs," he recalls. "We worked about 36 hours around the clock. The last one we did with a TracHorse took two guys about four hours."

Crews typically use the machine to tow the water-supply hose out to the work site, where it's connected to the hose on the reel. To make up for pressure lost along the hose run, crews typically use a 1 1/4-inch supply hose and connect it to a 1-inch hose on the reel to do the actual jetting.

money machines

OWNER:	Ted Berry Co. Inc., Livermore, Maine
VEHICLE:	MHP1 TracHorse easement jetter, Stanley Hydraulic Tools
APPLICATIONS:	Cleaning on remote easements, large tank cleaning
PRIMARY FEATURES:	8-10 gpm/2,000 psi water system; rubber tracks; powered dump bed; 600-foot hose reel
COST:	\$15,000 (plus \$10,000 for hose reel)



The easement machine helps crew members from Ted Berry Co. clean lines in areas that would be difficult to access with a combination cleaning truck.




The machine measures 80 inches long and 32 inches wide, can turn 360 degrees within its own length, and can traverse grades up to 60 percent.

"For a combination truck to access these easements, we'd have to build a gravel road. We did a job years ago with 12- and 14-inch oak trees growing in the easement. After that, we looked hard at how to approach these jobs faster and with less impact."

MATT TIMBERLAKE

"The truck might read 2,000 psi, but we might have only 500 at the tip," Timberlake says. "We figure out how much tip pressure we want and work backwards from there. It's easy to calculate the pressure drop."

The company is fabricating a custom reel that will hold 800 feet of 1 1/4-inch hose. That will enable crews to clean even larger remote-access lines and municipal and industrial outfall pipes. Renting a barge to float a combination truck to a remote outfall pipe can cost \$20,000 to \$30,000 a week. A barge large enough to hold a TracHorse costs about \$1,500 a week.

"They're extremely valuable machines," Timberlake says. "They've become such an important accessory to what we do." 

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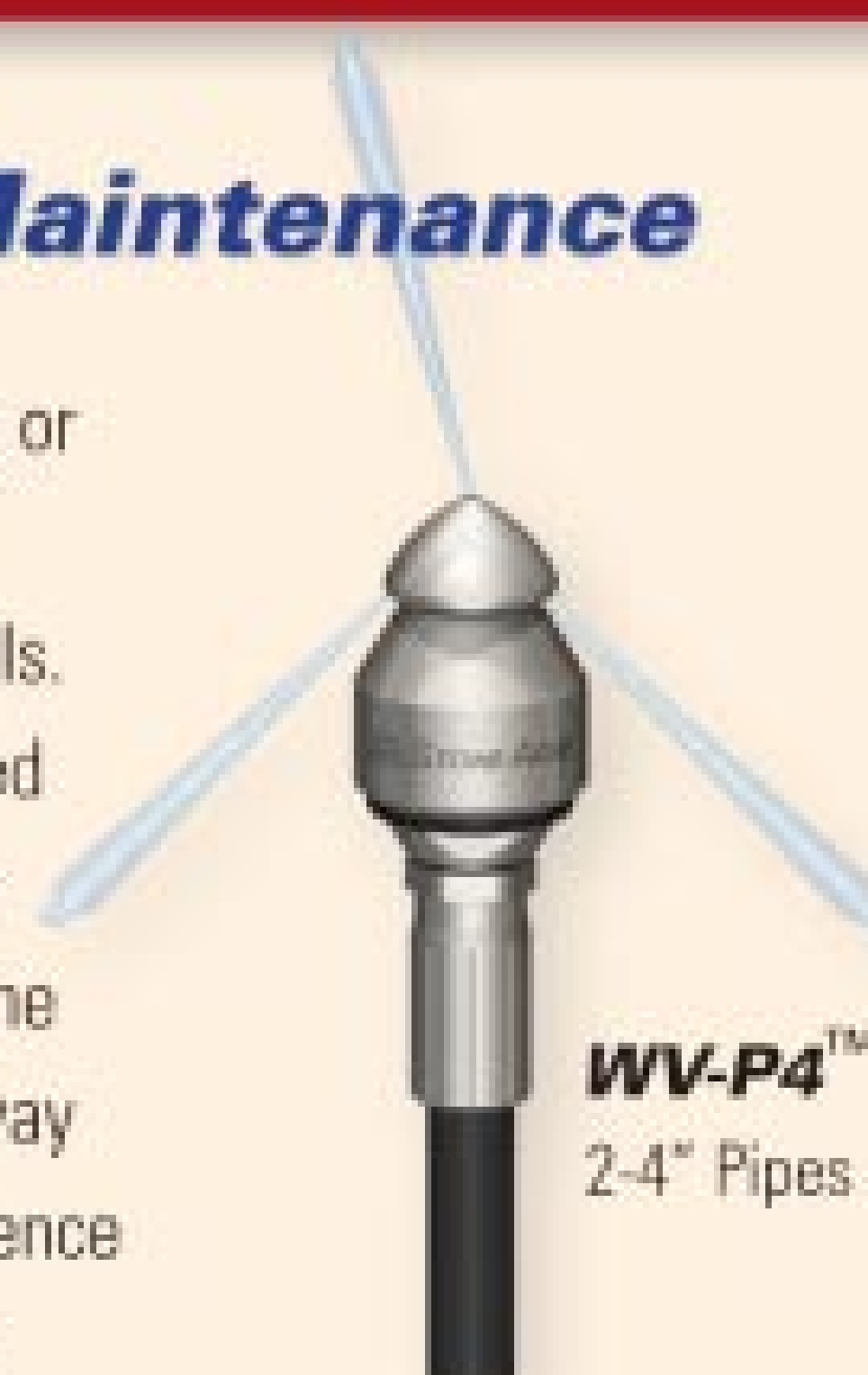
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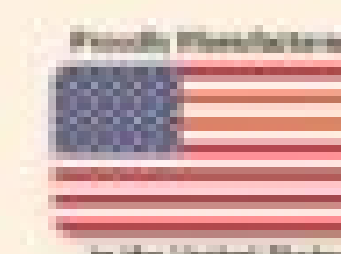
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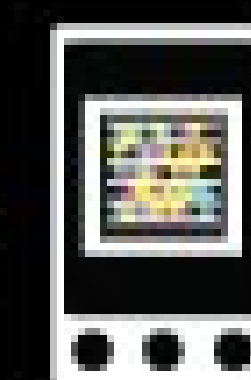
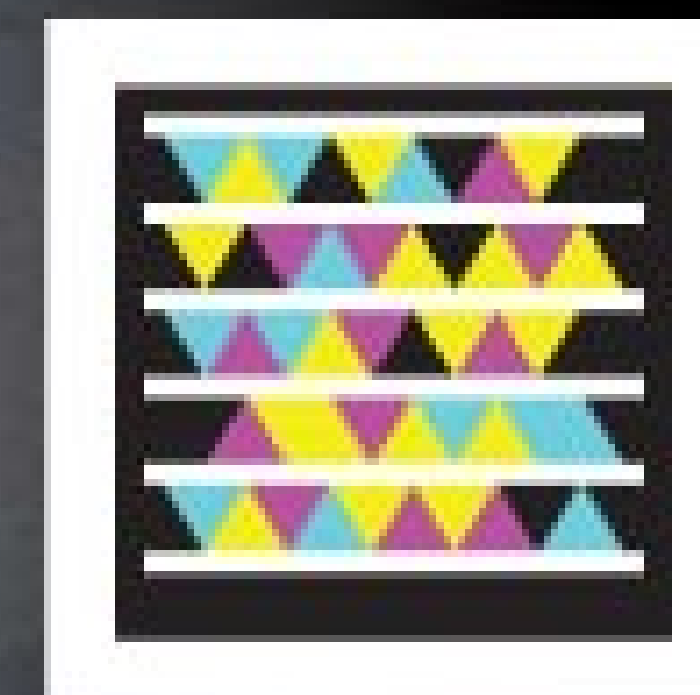
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Keeping Tabs

CONTRACTORS FIND GPS VEHICLE TRACKING PROVIDES A BOOST TO EFFICIENCY AND THAT FIELD TECHNICIANS READILY EMBRACE IT AS A TOOL THAT HELPS THE COMPANY

BY KEN WYSOCKY



Comments may be directed to
Ken Wysocky in care of Cleaner.

Some technicians don't care for Global Positioning System vehicle tracking, but there's no doubt they offer business owners a convenient way to run fleets more efficiently. GPS helps companies increase productivity and profitability by routing service calls more efficiently, saving fuel, time and money.

In addition, for companies whose technicians work in remote areas where cell phone service is spotty or nonexistent, GPS offers a safety net that alerts dispatchers to potential health or safety issues.

"There wasn't any resentment from our employees. Actually, they found it helpful. I tell them it's a security and safety issue – if a truck is sitting for too long, then we know someone who's alone might be hurt."
Dolores Eaton
Ivis Inc.

Some systems also provide enough detail to help technicians learn better driving habits. Here, three



DOLORES EATON
CEO AND PRESIDENT
Ivis Inc.,
Edmonton, Alta.
Employees: 38
Years in business: 14

contractors tell about their experiences with GPS tracking.

"We run GPS on 32 vehicles, from vacuum trucks that flush and clean sewer lines to service trucks and camera vans to management vehicles," says Dolores Eaton, CEO and president of Ivis Inc. in Edmonton, Alta. "We've been phasing in GPS sporadically as we could afford it since 2001.

"It's a useful tool because sometimes we can't get a hold of staff when they're out on a job where there's no cell phone service. We can send a message through the GPS and let them know there's another job coming. Then when they get back in the truck, they can reply back.

"We also bought GPS to track and dispatch vehicles more effectively. We have a monitor in the office that shows where our trucks are at all times. We can tell if they're in having coffee on a regular basis or whether they're working on a jobsite.

"There wasn't any resentment from our employees. Actually, they found it helpful. I tell them it's a security and safety issue – if a truck is sitting for too long, then we know someone who's alone might be hurt. We can then give them a call, and if no one answers, that could be a concern.

"It also helps us handle customer complaints. If a customer says a guy was there less time than he



DAVID RATLIFF
OWNER AND
GENERAL MANAGER
Midway Plumbing,
Abilene, Texas
Employees: 14
Years in business: 27

actually was, we can prove it because we can track how long they were on the jobsite. We're very happy with it. There are some things I'd like to get tied into it: see how much fuel is being used, for example, and when vehicle maintenance is required. But for now, it's a good tool for resolving customer complaints, tracking employees' locations, and sending them messages."

"I think we spend less than \$400 a month on GPS, and in terms of productivity and lost time and correcting time cards, GPS pays for itself, without a doubt. I don't think the drivers dislike it at all. It just keeps everybody honest."

David Ratliff
Midway Plumbing

"We primarily do residential plumbing and drain cleaning within a 90-mile radius around Abilene," says David Ratliff, owner and general manager of Midway Plumbing. "We started using GPS three years ago. It's a big advantage when we don't have a map for a small town in a rural area. We just look up the address and print out a map.

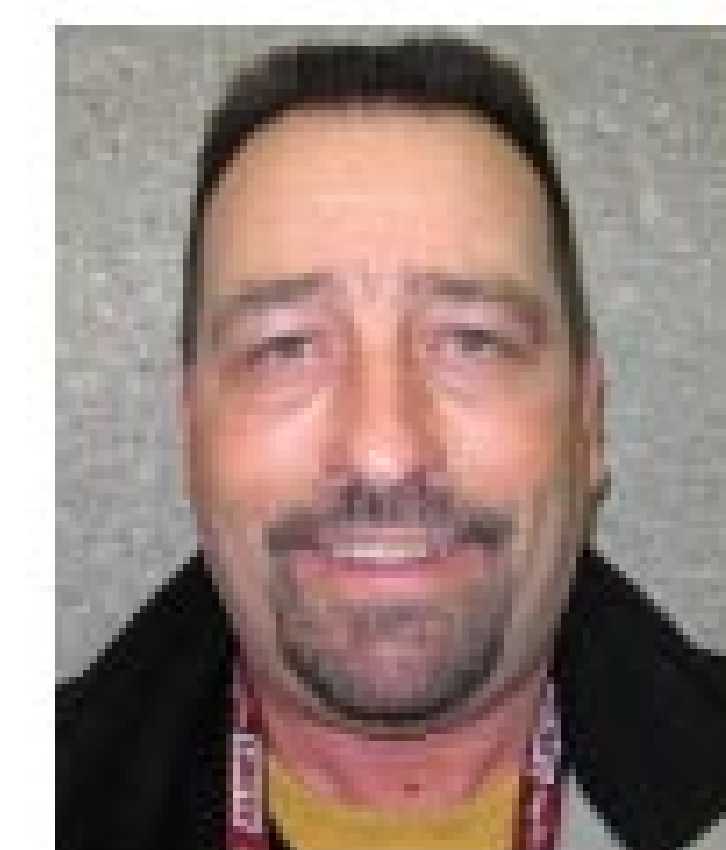
"In addition, we can actually tell a technician if he's missed a turn on the way there. We can see the trucks in real time on a big flat-screen monitor in our dispatch office. It also automatically keeps guys honest. All our guys use handhelds to clock in and clock out of jobs to receive payment. Sometimes a guy forgets to clock out. If you can trim 10 minutes here and seven minutes there, it adds up over the long haul.

"GPS also makes us more efficient. If one of our guys is on a job and he calls into the warehouse manager and needs something special, our manager can go to the dispatcher, click on that guy's truck to see where he's at, print off a map, and off he goes. As we go to laptops in the trucks, we'll be able to e-mail maps to the technicians.

"I think we spend less than \$400 a month on GPS, and in terms of productivity and lost time and correcting time cards, GPS pays for itself, without a doubt. I don't think the drivers dislike it at all. It just keeps everybody honest.

"I didn't have that big of a problem with employees. That wasn't the main reason for getting GPS. But the fact that they know they're being tracked prevents problems from happening. They can't do side work at night with your trucks, and if a truck is stolen, we can locate it.

"It also helps when a customer says a driver didn't get to the job until, say, 9:30 a.m., and we have a record that shows he was on site at 8:05 a.m. That has happened two or three times in the



SHAWN PERRY
PROJECT MANAGER
Kline's Services,
Salunga, Pa.
Employees: 70
Years in business: 55

last three years. It's just another tool to run your business profitably and efficiently. And the guys know it makes them more efficient, too."

"We cover a 150-mile radius around Salunga, which is near Harrisburg in south-central Pennsylvania," says Shawn Perry, project manager for Kline's Services. "We started using GPS on all our rolling equipment about a year ago. It's tied into

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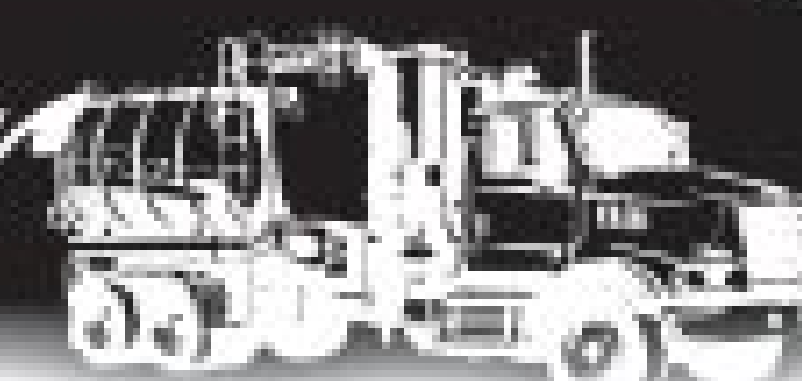
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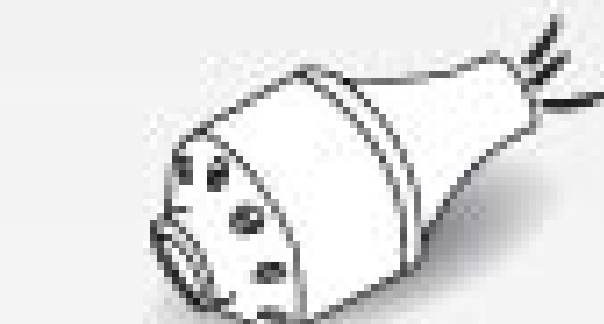


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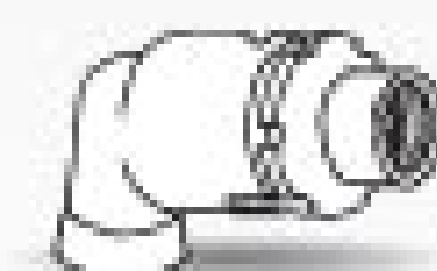
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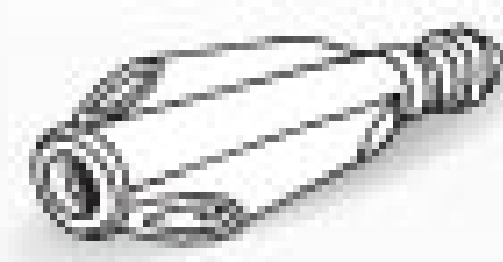
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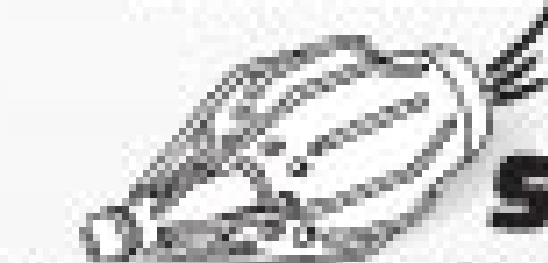
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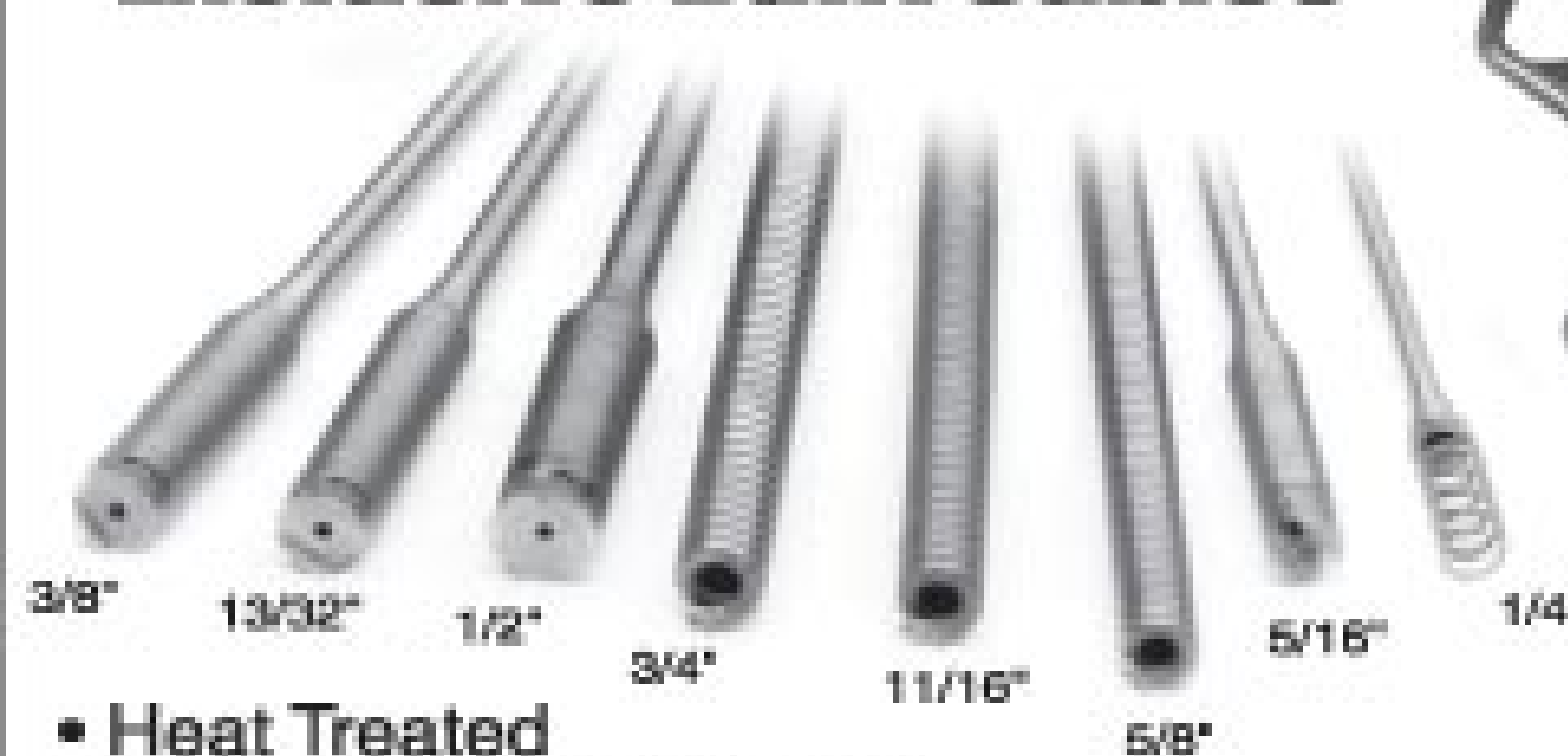
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Leading the Charge

A MICHIGAN CONTRACTOR RUNS A NONSTOP OPERATION TO CLEAN UP A MAJOR OIL PIPELINE SPILL THAT FOULED STREAMS AND MADE NATIONAL NEWS

BY SCOTTIE DAYTON



Using a Sed-Vac system, Terra Contracting workers dewater the excavation site to facilitate the removal of a damaged section of pipeline. (Photo courtesy U.S. EPA Flickr Site)

In late July, a 30-inch pipe transporting crude oil from Griffith, Ind., to Samia, Ont., began leaking near the pump station at Marshall, Mich.

An estimated 20,082 barrels (843,444 gallons) of oil leaked from the pipeline; of that, an estimated 8,033 barrels (337,386 gallons) entered Talmadge Creek and Kalamazoo River. Fearing the spill would reach Morrow Lake, an impoundment above a hydroelectric dam on the river, Enbridge Energy Partners, L.P., set up containment booms before the lake and deployed multiple vacuum trucks upstream to collect oil.

Officials, realizing the spill's extent, called Steve Taplin, CEO of Terra Contracting, a remediation contracting company in Kalamazoo. He ordered the initial wave of equipment and personnel while driving the 40 miles to Marshall.

"Representatives took me to the first location and the sight was overwhelming," says Taplin. "It had rained heavily that weekend and water in the creek was flying past. I immediately ordered more of everything."

Enbridge, working under the direction of the U.S. EPA and the Michigan Department of Natural Resources and Environment (MDNRE), soon

"Representatives took me to the first location and the sight was overwhelming. It had rained heavily that weekend and water in the creek was flying past. I immediately ordered more of everything."

Steve Taplin

instituted a nonstop operation with many major contractors and dozens of subcontractors. Taplin's crew placed containment booms; vacuumed or transported oil, water, and oil-water mixtures; responded with identical action to a second spill; and decontaminated most of the cleanup equipment. Four months later, clear water flowed again in the creek and river. The oil never reached Morrow Lake.

EARLY HOURS

When Taplin saw the expanse of work, he called in people and equipment from six projects around the

tough job

PROJECT: Contain and clean up oil spill

CUSTOMER: Enbridge Energy Partners, L.P.

CONTRACTOR: Terra Contracting LLC, Kalamazoo, Mich. and others

EQUIPMENT: Assorted vacuum, sewer cleaning and hydroexcavating equipment

RESULTS: Oil spill contained; remediation ongoing

country. Those jobs remained shut down for two weeks. During the first few hours, Taplin stationed crews at five sites around Marshall.

They operated a dozen 3,000-gallon vacuum loaders from Presvac Systems and Wastequip Cusco; two 6,000-gallon stainless steel vacuum tankers, one each from Acro Trailer Co. and Brenner Tank LLC; and a 7,000-gallon and 6,700-gallon bulk tanker from Polar Tank Trailer. The bulk tankers have no pumps.

"The vacuum tankers would discharge into the bulk tankers, then return to pumping oil from the creek and river," says Taplin. "The bulk tankers transported the oil-water to the growing frac tank farm for loading. We worked 12-hour shifts, and the trucks never stopped running." By that weekend, 100 Terra employees were on site. Needing more, Taplin hired staff or tapped key subcontractors for extra people.



A Terra Contracting crew off-loads a Presvac 9,500-gallon vacuum tanker into a 21,500-gallon frac tank. (Photos courtesy of Terra Contracting LLC)

The confluence of Talmadge Creek and the Kalamazoo River was a key containment site. "It's a small creek, so with EPA approval we put in row after row of booms angled to direct the oil to shore," says Taplin. Six hundred feet of boom and six vacuum trucks were deployed at the confluence.

Meanwhile, Enbridge set up 20,000-gallon portable frac tanks at the small pump station. Taplin offered to run the tank farm, provide all paperwork, and coordinate shipments of oil and oil-water mixtures to the Enbridge facility in Griffith, Ind. "Our tankers ran 24/7 because we could switch drivers at our Kalamazoo facility," says Taplin. "My crew also unloaded all the arriving trucks and loaded the tankers going to Griffith."

EXPANDING THE OPERATION

The pump station had a 15-foot-wide service road 1,000 feet long. By the third day, inbound and outbound tankers, the arrival of more frac tanks, and a major rainstorm created traffic jams. Enbridge hired a contractor to build roads and expand the area to accommodate 128 frac tanks. Taplin assumed command of fugitive dust management, including watering roads and sweeping streets.

To integrate road construction with tank farm activities, Taplin brought in a portable radio tower and equipped his people with radios. They numbered tanks and marked their locations on a map. "We tracked everything very closely," he says. "It was a logistics nightmare."

"Enbridge didn't mess around when it came to repairing the pipe. The infrastructure they built to reach that marshy area was awesome."

Steve Taplin

As cleanup progressed, the water in the oil-water mixture increased beyond the percentage accepted by the Griffith facility. "Frac tanks have valves at various levels for dewatering," says Taplin. "My people installed a length of clear tubing in the vacuum hose so they could close the valve as soon as they saw oil coming through."

The water, stored in specific frac tanks, was filtered through a carbon treatment system to remove dissolved hydrocarbons before being transported to a nonhazardous disposal facility. Oil skimmed from the frac tanks was consolidated in different tanks for transport to Griffith.

"I had six 3,000-gallon vacuum trucks just pulling water and skimming oil," says Taplin. "In one shift, tankers brought in 275,000 gallons." To improve efficiency, Taplin's men built a header system using hundreds of feet of hose, valves, and clear tubes to pump water to the carbon treatment unit and free the badly needed vacuum trucks.

NOTABLE ACHIEVEMENTS

Meanwhile, a crew at Heritage Park on the east side of Battle Creek skimmed oil nonstop using one of three Vactor combination sewer cleaning machines from Federal Signal Corp. They worked for more than a month to remediate the site, one of the first to pass inspection.

A notable contribution to the cleanup was Terra's Sed-Vac, a system that works with a Guzzler industrial vacuum loader pulling 5,300 cfm at 28 inches Hg. It enables crews to reach out into a waterway and vacuum oil off the surface.

"We run the 8-inch vacuum hose to a special head that replaces the bucket on our long-reach – 65 feet – Komatsu excavator," says Taplin. "The head has a horizontal metal pipe for attaching the hose, then a 90-degree fitting to a vertical pipe."

The Sed-Vac worked at a flume – pipes that allowed the creek to flow through, but trapped the oil. The Guzzler unit ran continuously for two weeks, while vacuum loaders pulled off the oil and transported it to the tank farm.

ALL-OUT EFFORT

"Enbridge didn't mess around when it came to repairing the pipe," says Taplin. "The infrastructure they built to reach the marshy area was awesome. They cut trees and shrubs, then laid thousands of 4- by 25-foot hardwood crane mats 12 inches thick for roads."

The Sed-Vac unit worked alongside the excavators as they dug a sizable hole 10 feet deep to expose the broken line. Taplin then replaced the Guzzler unit with two Vactor 2100 PD combination machines to keep the hole dry as workers drove in sheet piling and replaced the bad section. The operation took two weeks.

Oil that sat for a while sank. A subcontractor dredged the submerged contaminated sediment and dewatered it in synthetic tubes. Meanwhile, Taplin's crew ran the collected water through a treatment plant before pumping it into the river. In September, Enbridge had a smaller oil spill in Romeoville, Ill. Taplin dispatched 30 employees and equipment to do the same duties. They finished in late October.

WINDING DOWN

Every piece of equipment used in the cleanup was decontaminated. Taplin assigned 40 men to run the largest of the operations. Cleaning crews used a high-pressure trailer-mounted waterblaster from NLB Corp.

A multi-gun valve enabled them to run nine lances simultaneously while the machine pumped 50 gpm at 3,500 psi. A boiler heated the water to 100 degrees F, and then cleaning solution was incorporated into the flow.

"Everything received a tracking number so owners could reclaim it," says Taplin. "My people were constantly moving equipment in and out. They even repackaged and shrink-wrapped booms for pickup." Work on the site was still ongoing as of late January 2011. ■



Operators from Terra Contracting use the Sed-Vac unit with Guzzler industrial vacuum loader to skim oil at the leak site. The machine pulls 5,300 cfm/28 inches Hg.

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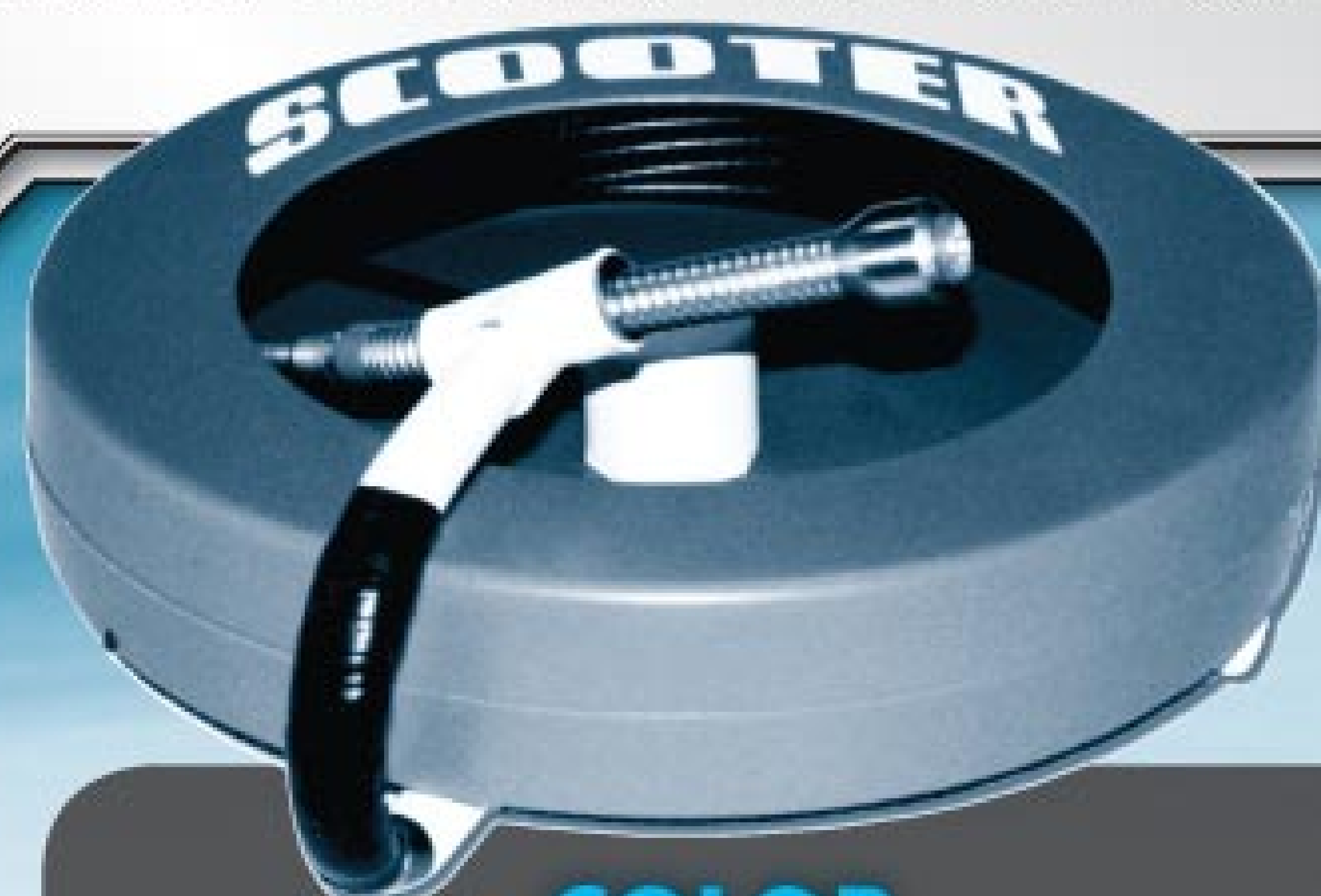
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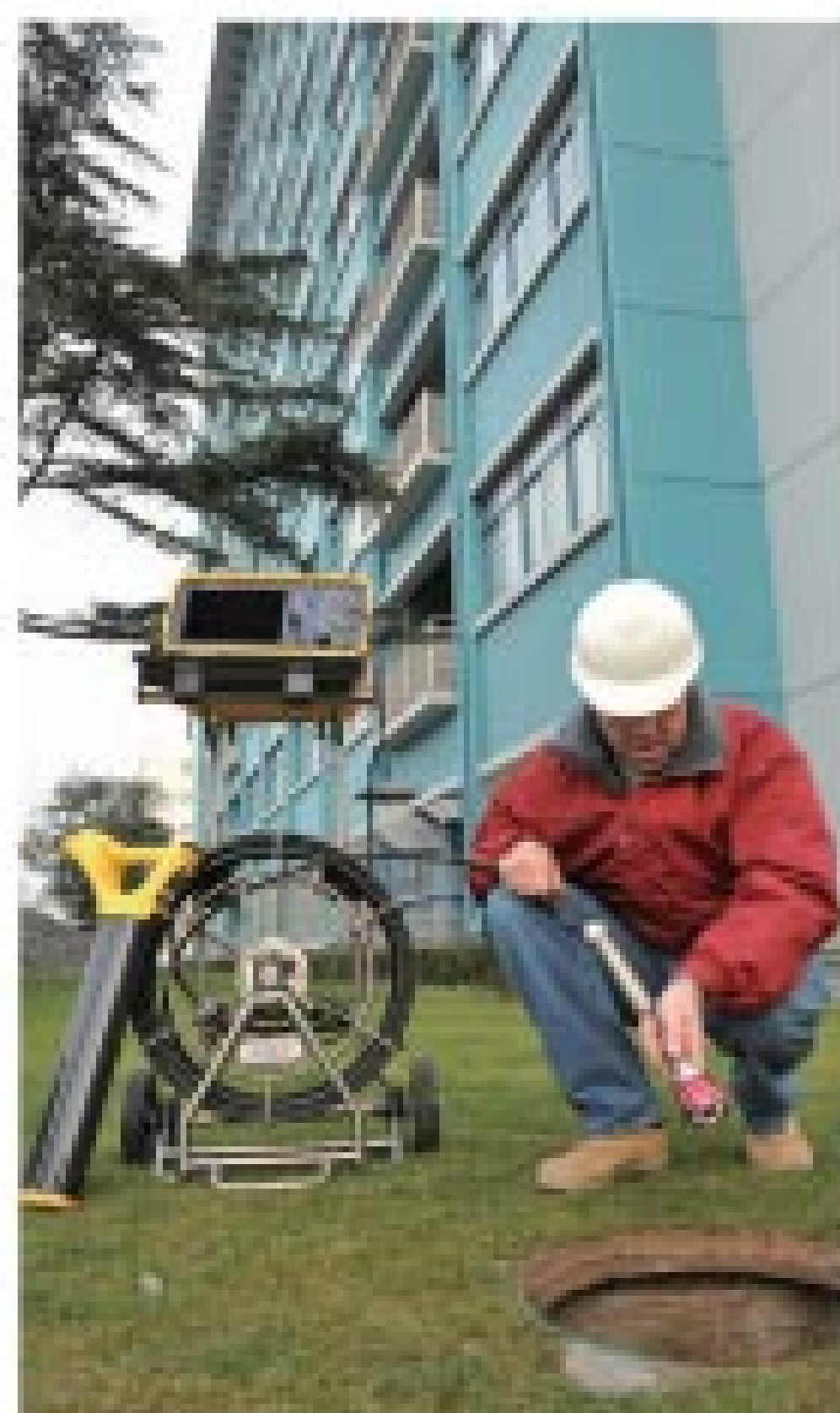
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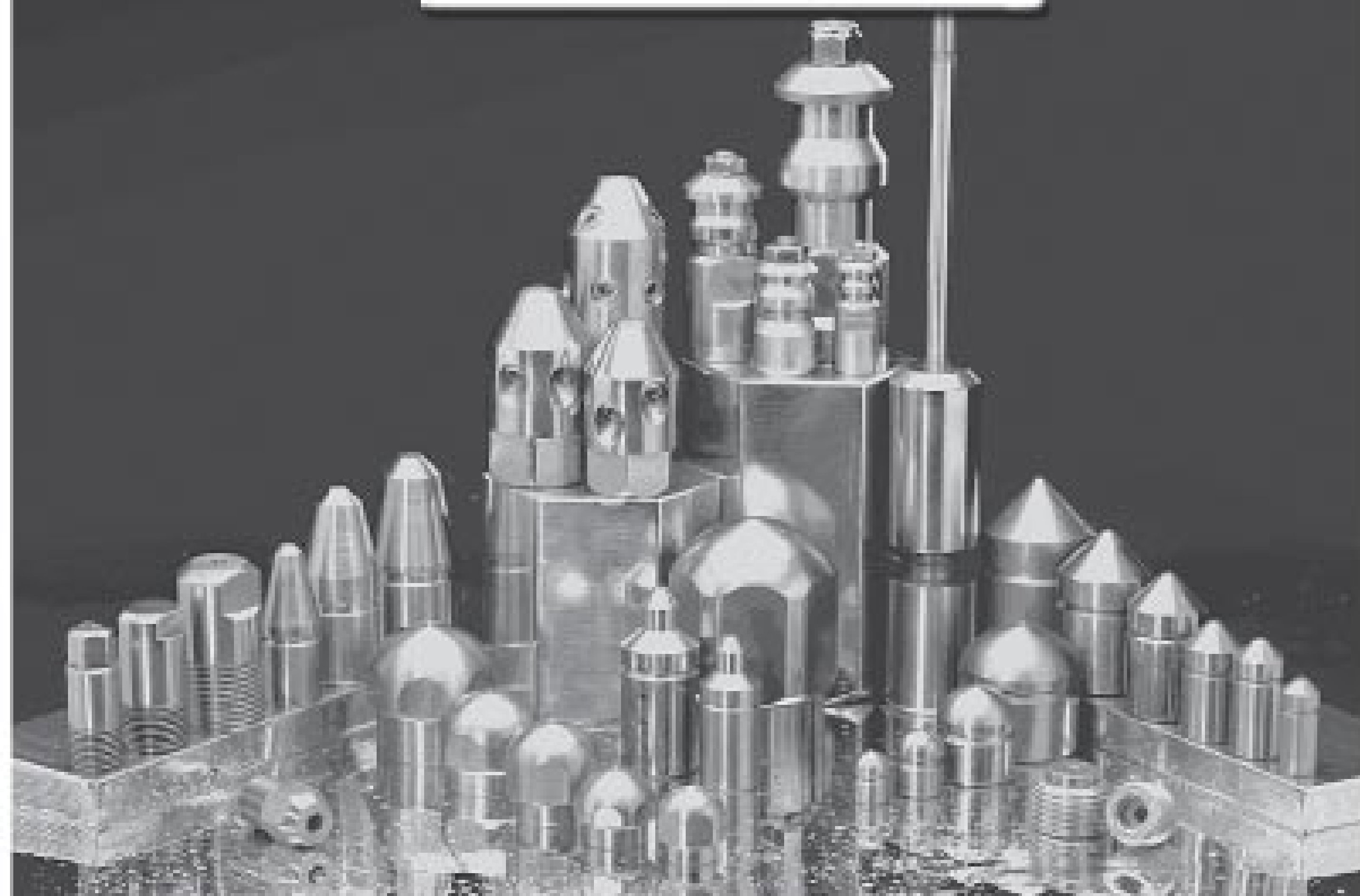
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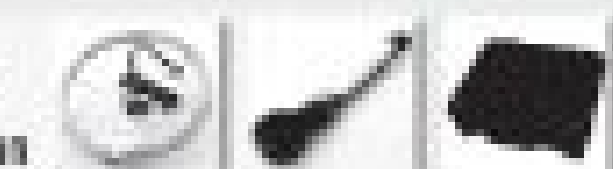
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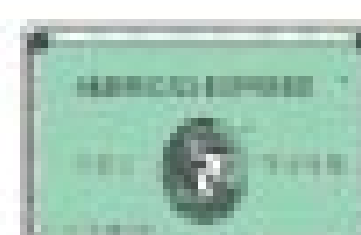
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Business and Office Productivity Tools

BY BENJAMIN WIDEMAN

STOP-BY-STOP TRACKING

Total Activity Control from Clear Computing provides customizable stop-by-stop tracking that lets users monitor business operations in real time. Among the benefits are real-time visual monitoring of activity start and completion, status to flag problem work activities, profit and loss by service stop as each stop is completed, profit and loss for each work order once invoiced, and faster invoicing of completed work.

The product gives drivers an easy method to send back the status at each location throughout the day. Single-click indications of job start and end and additional information can be sent to provide extra work to be invoiced, normal billable work completion, and status for potential additional sales. 888/332-5327; www.clearcomputing.com.



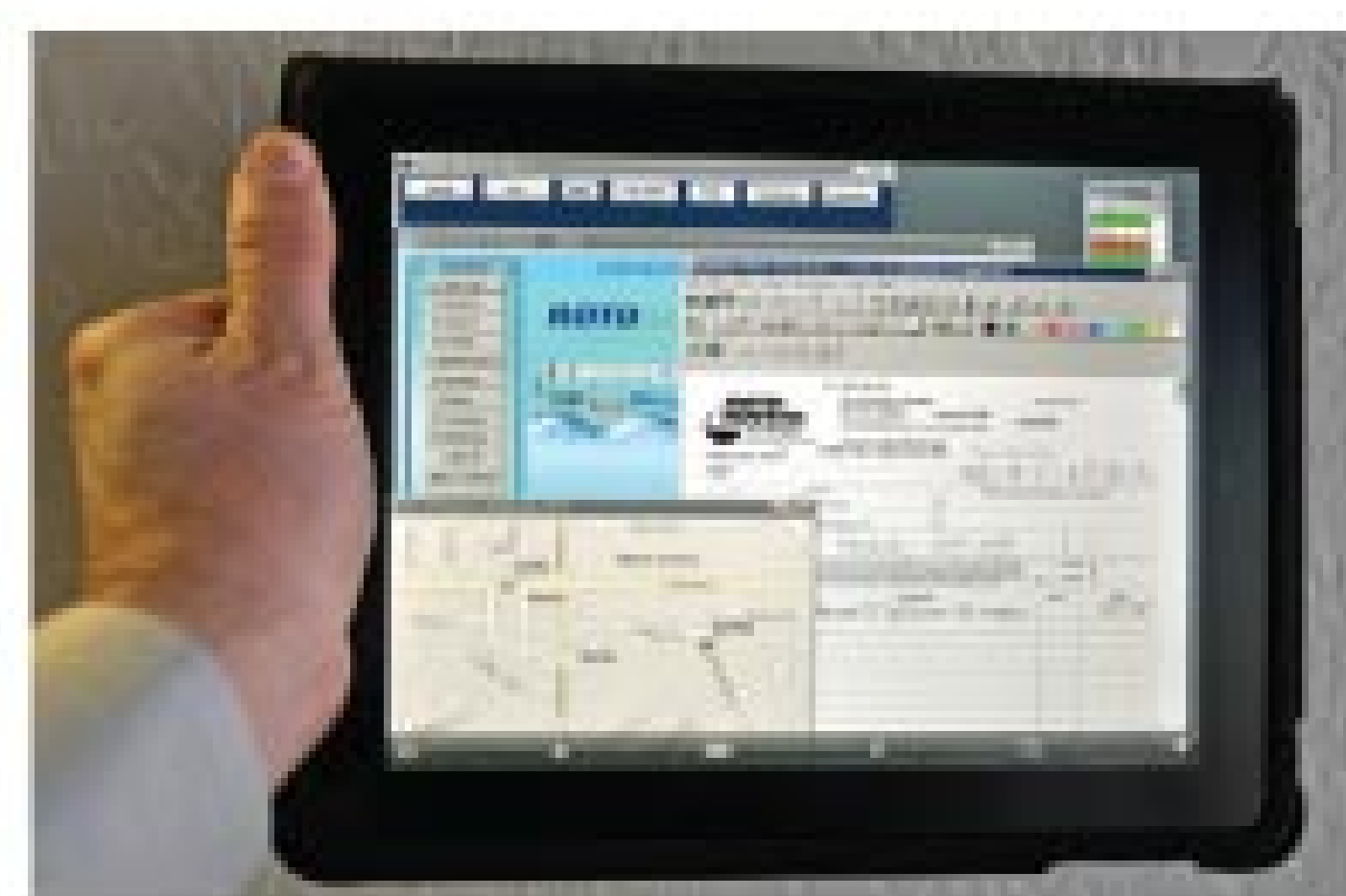
enabled into the map, a NEMA GPS receiver can be used to find the position on the map. Once the pipe identifier field has been set, the user can click on the map and have the identifier sent to POSM.

The map can also be used to enable hyperlinks when the map is clicked. This lets users open the POSM inspection stored on the POSM Server. Search functions are built into the map, allowing users to select a layer and field to search the map. Search results are highlighted on the map. 859/274-0041; www.posm.us.



DETAILED OR SUMMARY WORK ORDERS

Version 4 of Summit Service Profit Builder software from Ritam Technologies offers detailed or summary work orders with complete job history and diagrams. Other features include customer maintenance agreements for ongoing revenue, appointment dispatching or priority dispatching options, automatic reminder cards, automatic repeat jobs, automatic batch or individual e-mail invoices and statements, integrated credit card processing, driver efficiency reporting, geographic view of routes plus revenues, optional parts inventory tracking on individual trucks, 24/7 access to a training video library, and QuickBooks and PeachTree integration. 800/662-8471; www.ritam.com.



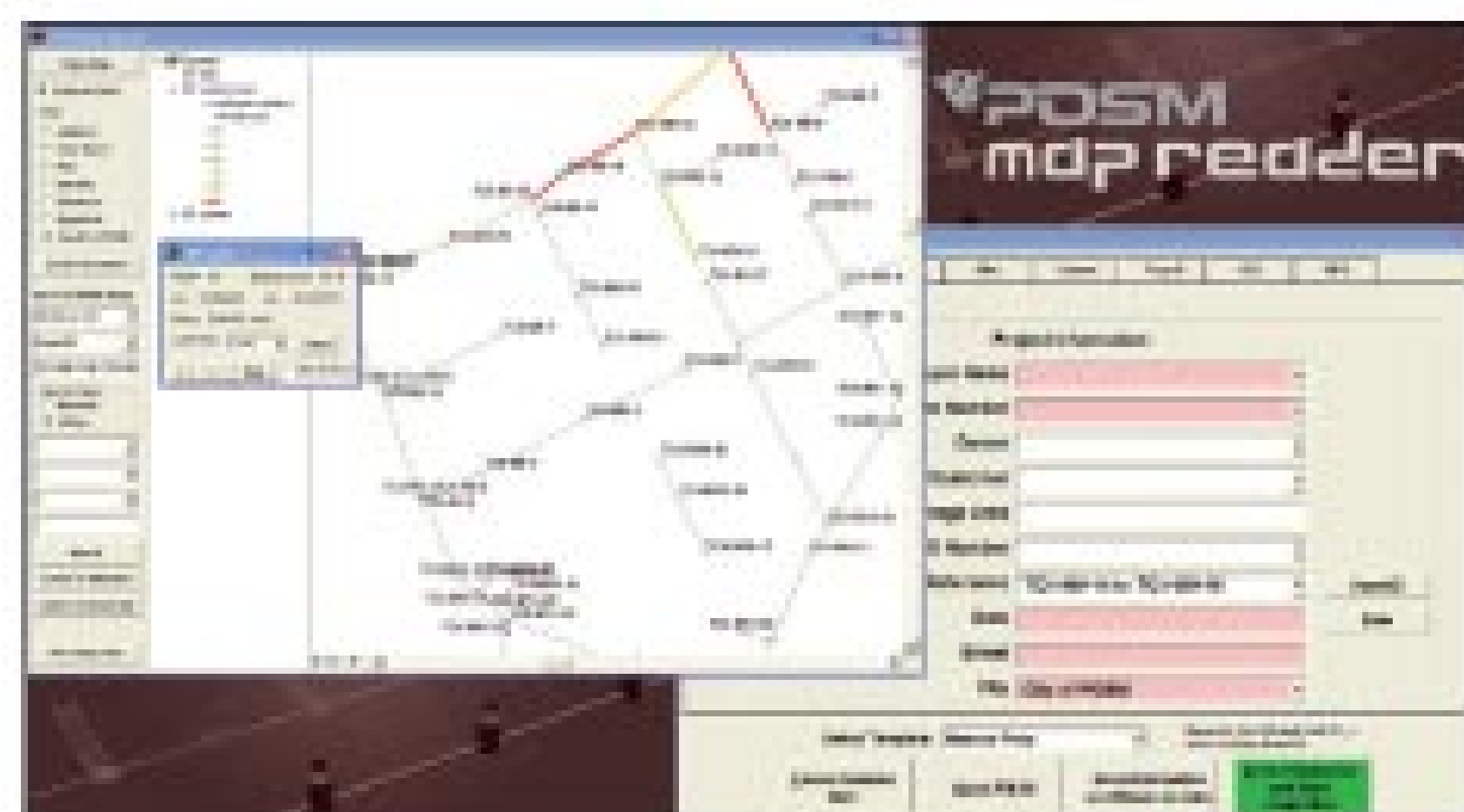
ATTACHING FILES OR DOCUMENTS

JLinkit from FamHost enables users to attach any file or document to specific customer records from any computer or wireless device in five ways: E-mail (enter in the subject line the name of the record to be attached); virtual folder (slide or save a file into the JLinkit folder on a laptop or computer); FamScan (scan batches of documents and JLink them); JLinkit.com (visit the website and browse to the desired file from any computer); and smart media devices (send photos of a jobsite by turning on a camera anywhere there is free Wi-Fi and upload the files). 800/658-1676; www.famhost.com.

INTERACTIVE MAPPING

The Pipeline Observation System Management POSM Map Reader is an interactive mapping application that improves inspection efficiency and accuracy. POSM Pro users can easily retrieve and input inspection data into a session using existing GIS data for quick and accurate reporting.

POSM Map Reader uses a published ESRI map to display map data, GPS to locate the current position, and links to POSM inspections. With the GPS layer

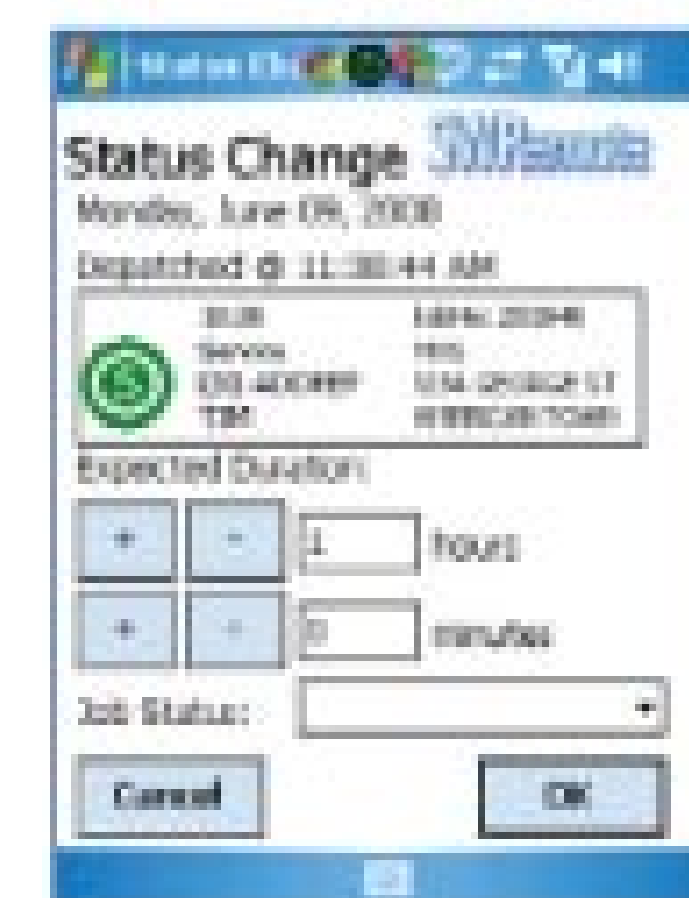
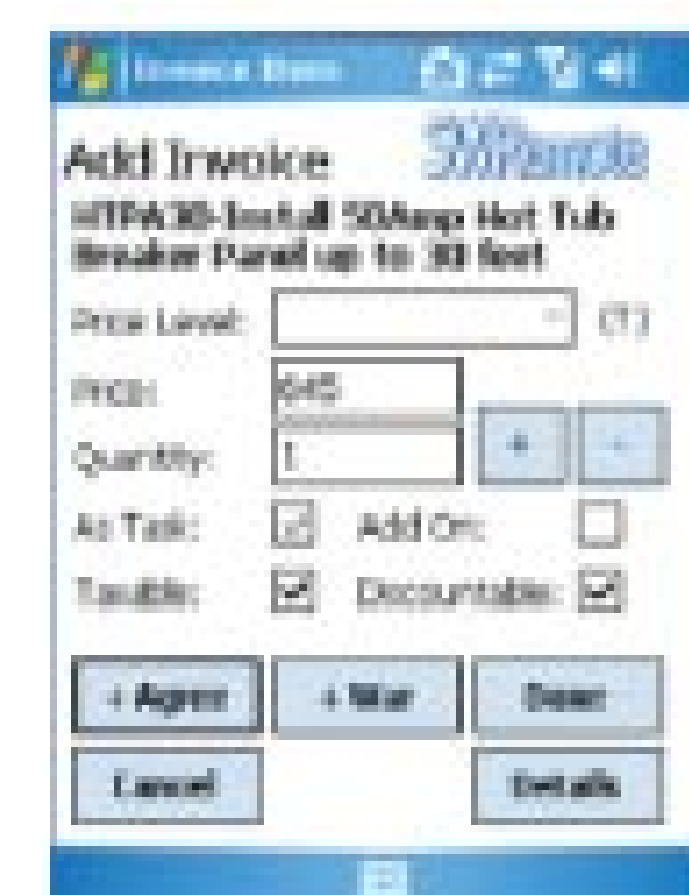


REAL-TIME JOB DATA

Mobile Technician software from SWRemote allows service contractors and technicians to send and receive real-time job data while on service calls using ruggedized mobile devices. It integrates with SuccessWare21 operations and management software to automate many routine service call processes, allowing technicians to spend more time on revenue-generating activities.

The system automates service orders, invoices, inventory management and time cards. Technicians can close sales faster, submit material requisitions, suggest and document recommended future repairs, print invoices, and receive credit card payments from jobsites. Meanwhile, office staff no longer bogged down by data entry and invoicing can spend more time scheduling service calls and acting on sales opportunities.

A related Mobile Inventory tool is an on-truck and in-warehouse software that cuts inventory control expenses by managing receipts, transfers, requisitions, returns and physical counts from one mobile device. 800/299-2079; www.swremote.com.



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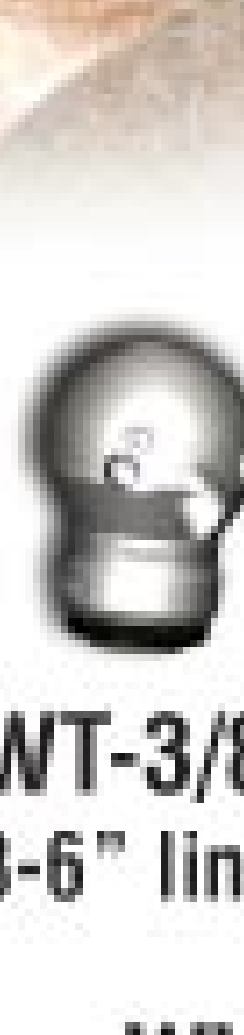
WD-1"
(8-36" lines)



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& 3/4"
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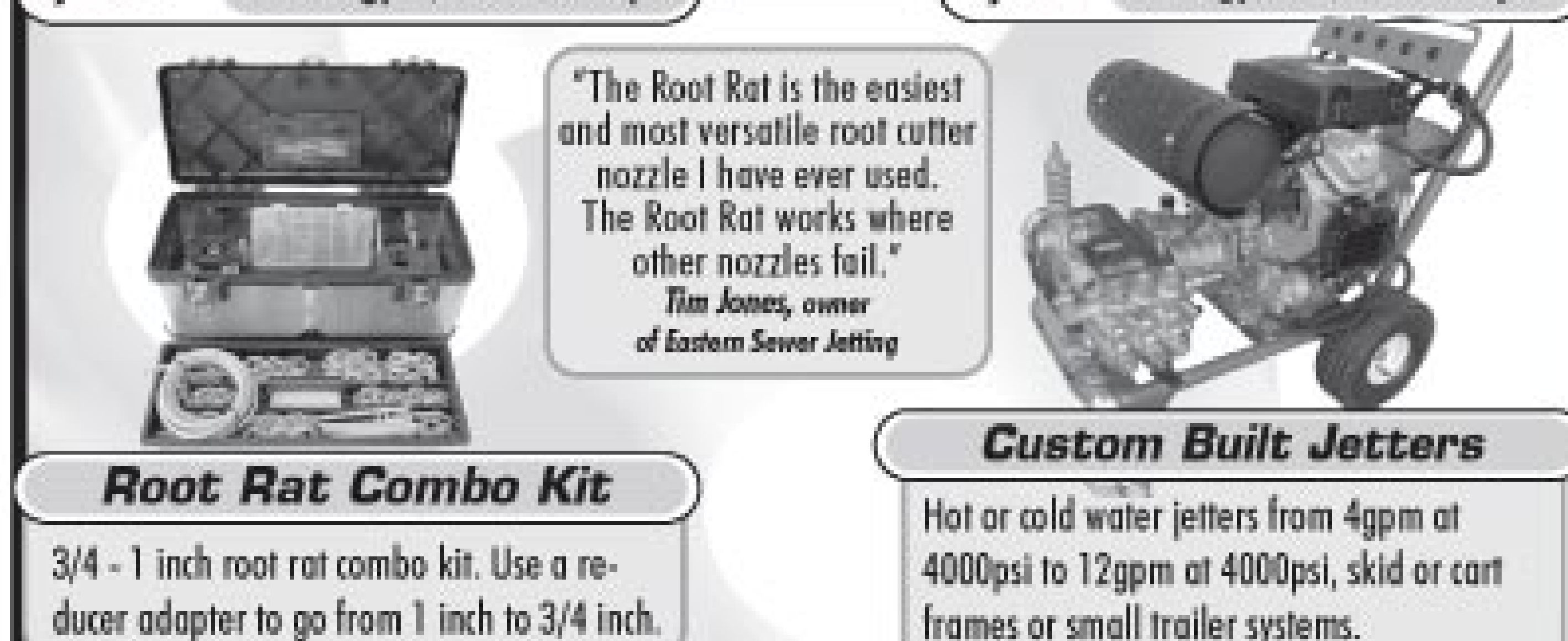
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Integrating a Cleaning Program to CCTV

BY SCOTTIE DAYTON

PROBLEM

The camera inspection crews of Henry County (Ga.) Water and Sewerage Authority were running months behind the cleaning crews. Lines were often soiled by the time they arrived to inspect them. The authority needed a way to integrate the two departments to maximize efficiency.

SOLUTION

The authority purchased Granite XP Lite software from CUES, enabling cleaning crews to send daily status reports to the central office, simplifying planning and scheduling for both departments. Crews map the sewer lines from GIS into the software, avoiding manual data entry with its risk of error. The software automatically aggregates observation codes entered by cleaning crews into a central database, and cleaned pipes appear on a map color-coded with a date-cleaned label, enabling supervisors to schedule inspections more effectively.



The software allows managers to generate reports that identify patterns and relationships between customer trouble tickets, SSOs, and cleaning frequencies. They also can run reports to assess linear foot production, overall percent completion for yearly goals, cubic yards of debris removed, and pipes likely to fail soon.

RESULT

"Granite XP allows us to better plan for capital improvement projects or to plan and schedule rehabilitation work," says administrative coordinator Vicki Mott. 800/327-7791; www.cuesinc.com. 

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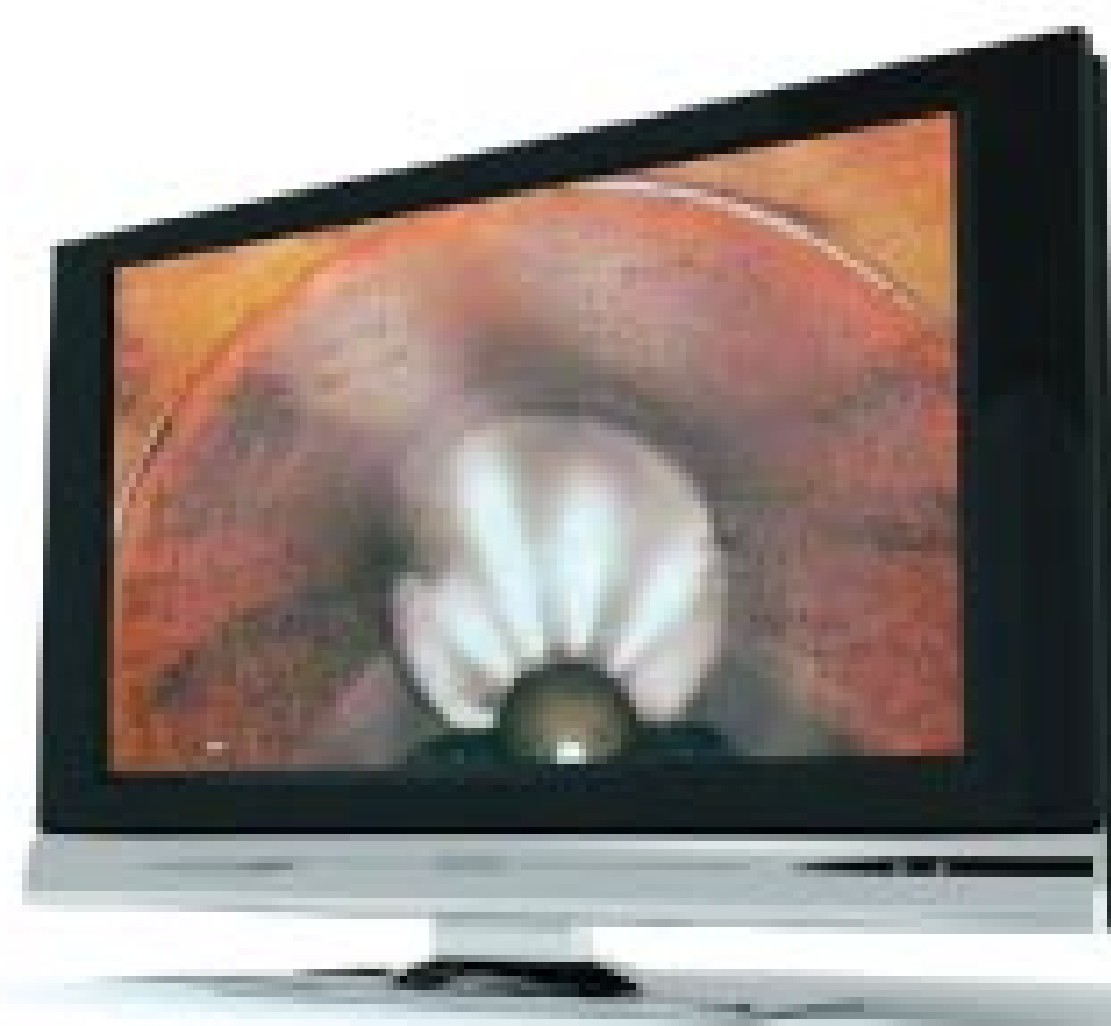
NASSCO TO PRODUCE JETTER VIDEO, CONDUCTS INDUSTRY SURVEY

The National Association of Sewer Service Companies will produce a video focusing on best practices for cleaning and jetter usage. The project will include information on equipment and tools, step-by-step instruction, and safety tips for cleaning pipes. It will cover basic information and benefits of pipe cleaning, followed by an overview of jetter and vacuum units, components and capabilities, and a demonstration of sewer cleaning from start to finish.

NASSCO also conducted research to understand the challenges, concerns and opportunities within the underground industry. Results from the 25-question, online survey showed that NASSCO members believe networking, education and training continue to be the main motivators for NASSCO membership.

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Ritam Technologies has launched an online products and equipment store, offering 24-hour shopping, the ability to research and compare products, and a simple order process. The store can be found at www.cole-mart.com/ritam.



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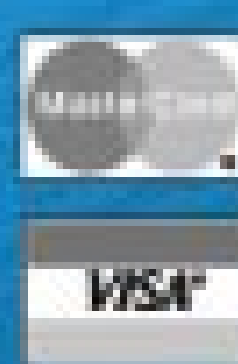
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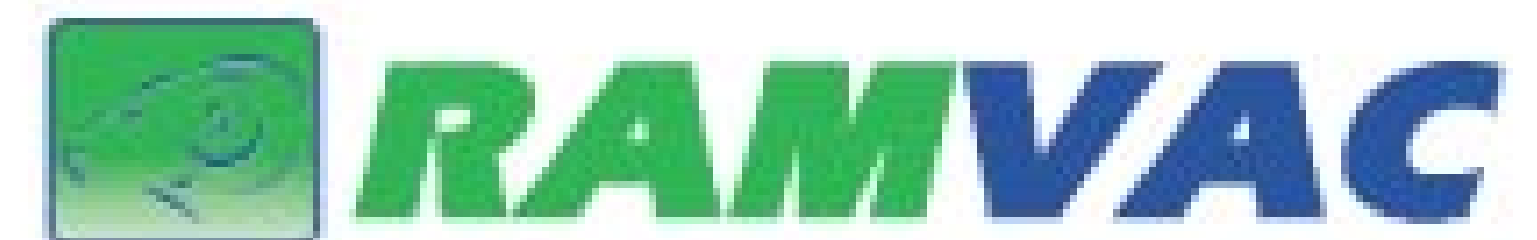
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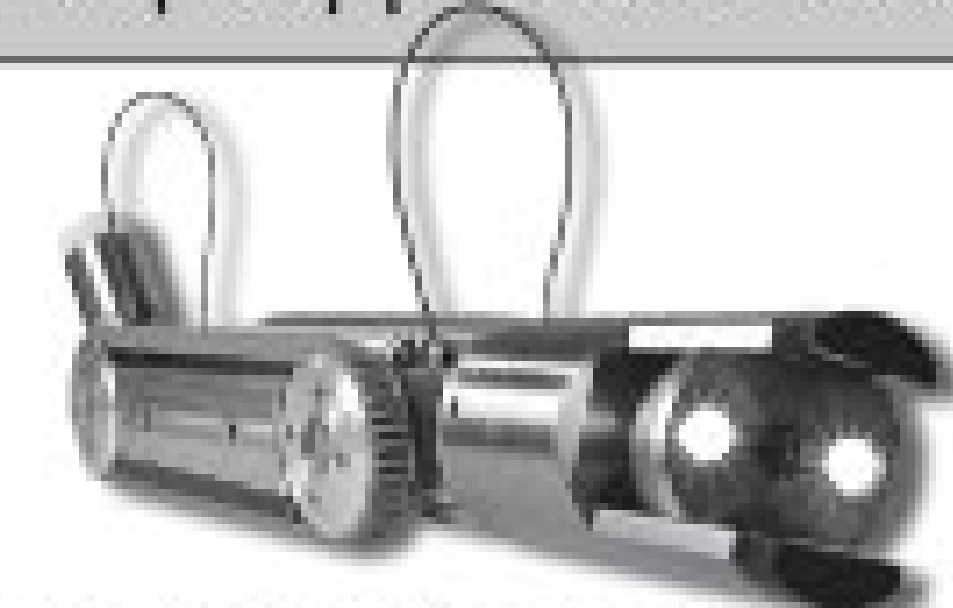
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February



2001 Peterbilt 357 Vac Truck: C-10, 127K miles, 21/46 axles, Fuller 8LL, ATRO susp., PTO, front floats, cruise, NVE pump, Keith Huber tank, 3,200 gallon cap.....\$69,500
715-546-2680 WI CBM



(2) 1999 Sterling LT9501: Cat 3126 @ 230 HP, Allison A/T, spring susp., 86K miles and 82K miles, disc wheels\$19,500 Choice
715-546-2680 WI CBM



2007 Ring-O-Matic 750 High CFM Vac Trailer: Cat 3024 @ 50 HP, 696 hours, liquid-cooled, 750 gallon cap., 850 CFM lobe style blower, 20,860# GVW.....\$29,500
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2001 Sterling LT9500: Cat C-12 @ 395 HP, 97K miles, shows 7K hours, 20/46 axles, spring susp., 273" WB, 22.5 tires, disc wheels, VacCon end dump, Dresser rotating lobe blower\$79,500
715-546-2680 WI CBM



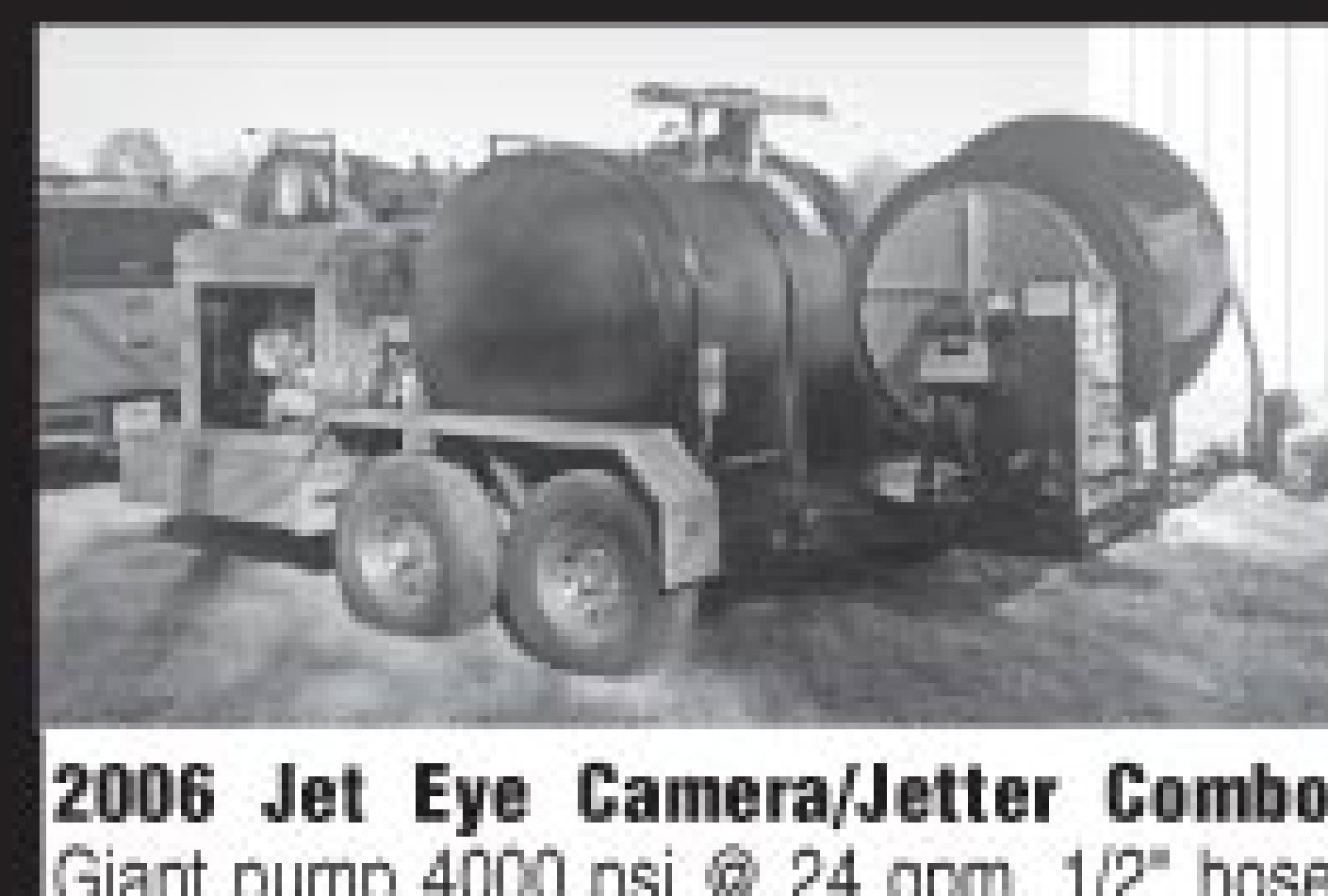
2001 Vac-Con Water Jet on International 4700: 50 gpm @ 3000 psi, 1600 gal. plastic water tank, city owned. More pictures at www.KHTrucks.com.....\$24,500
972-938-1905 TX C02



Sewer Equipment Company Trailer Jet Model 747: Diesel with 394 hrs., 35 gpm @ 2000 psi, 500' new hose, city owned. See pictures at www.empireequip.com.....\$13,500
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1992 Kenworth T450 Tractor: With 2200 gallon Cusco vacuum tank, 19,000 miles.
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1995 Vactor 1645: Ford L9000 chassis, 10.5L Cat 3306, 9-speed Fuller trans., 3.73 rear end, 18" blower, wet and dry vac, 3000 gal tank. Ready to work!\$62,500
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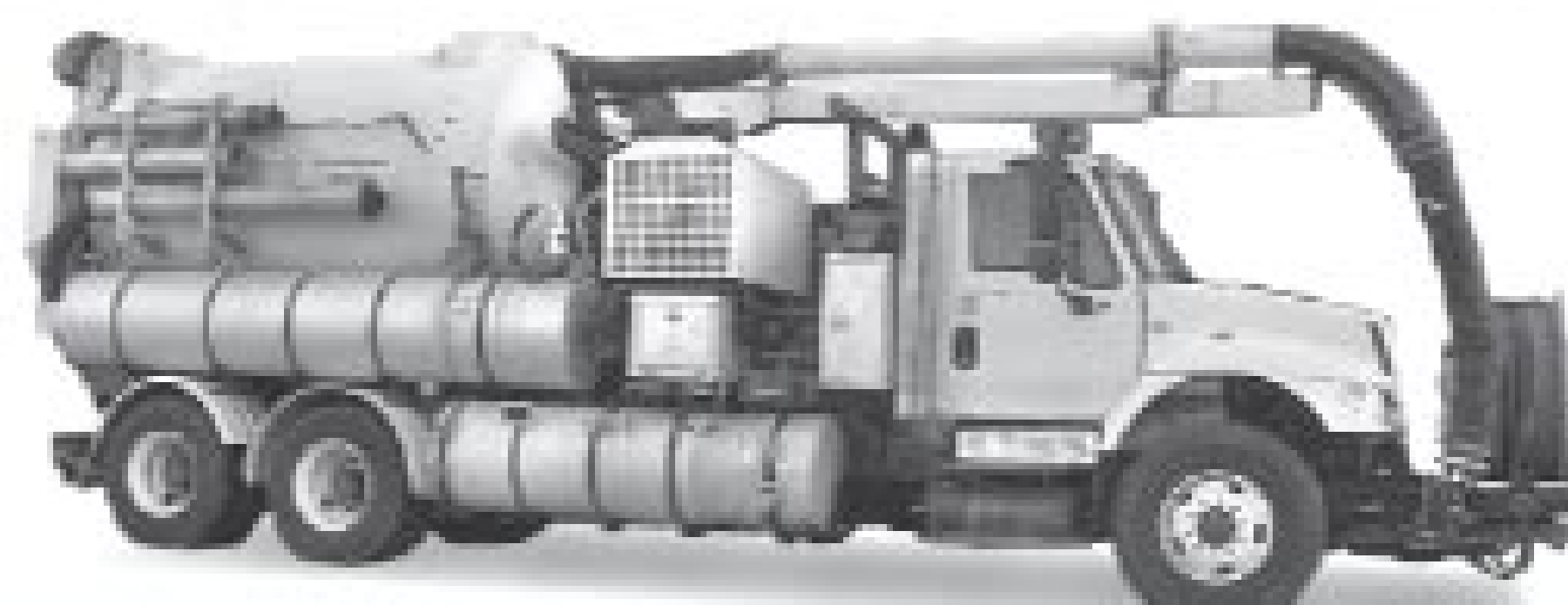
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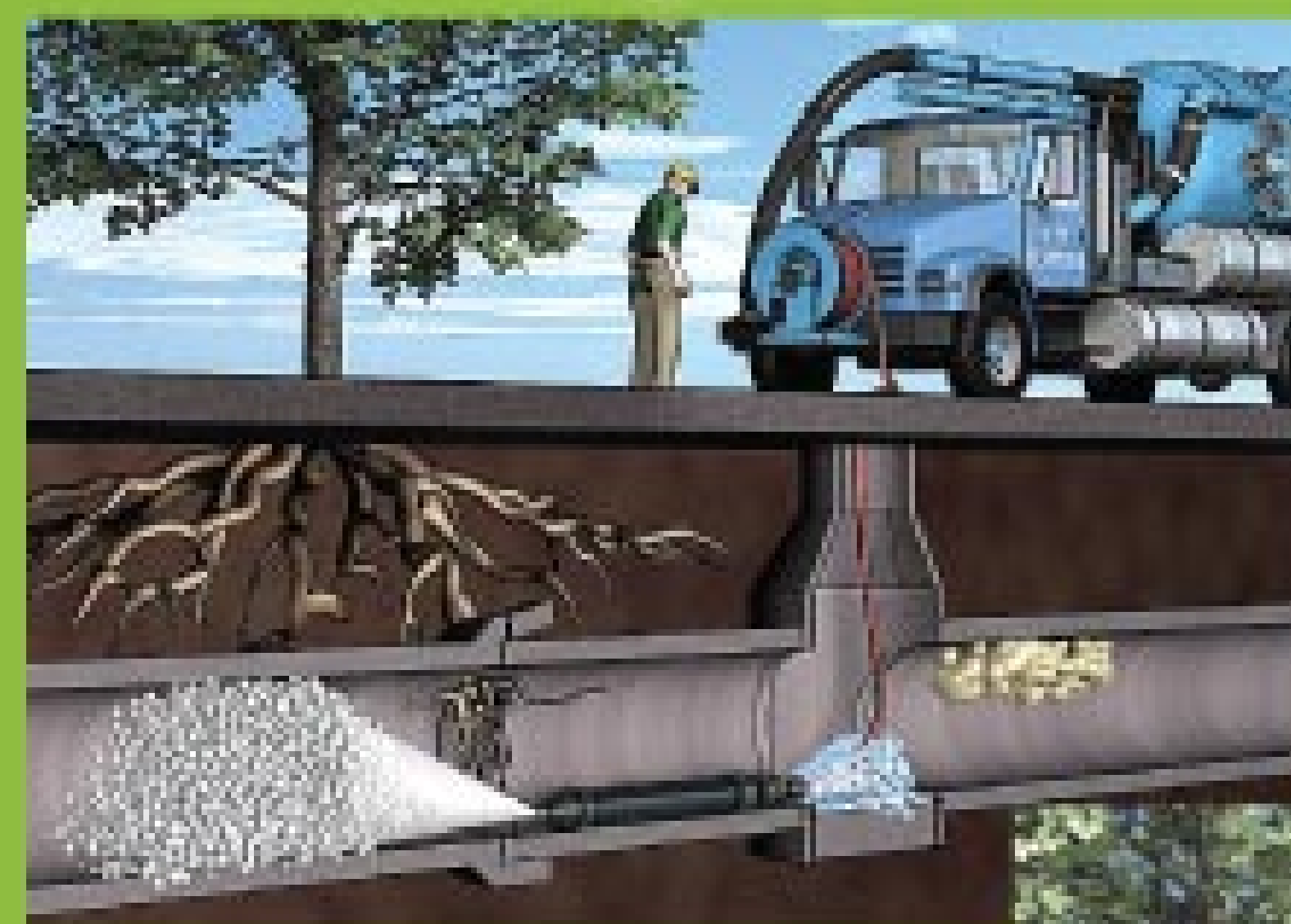
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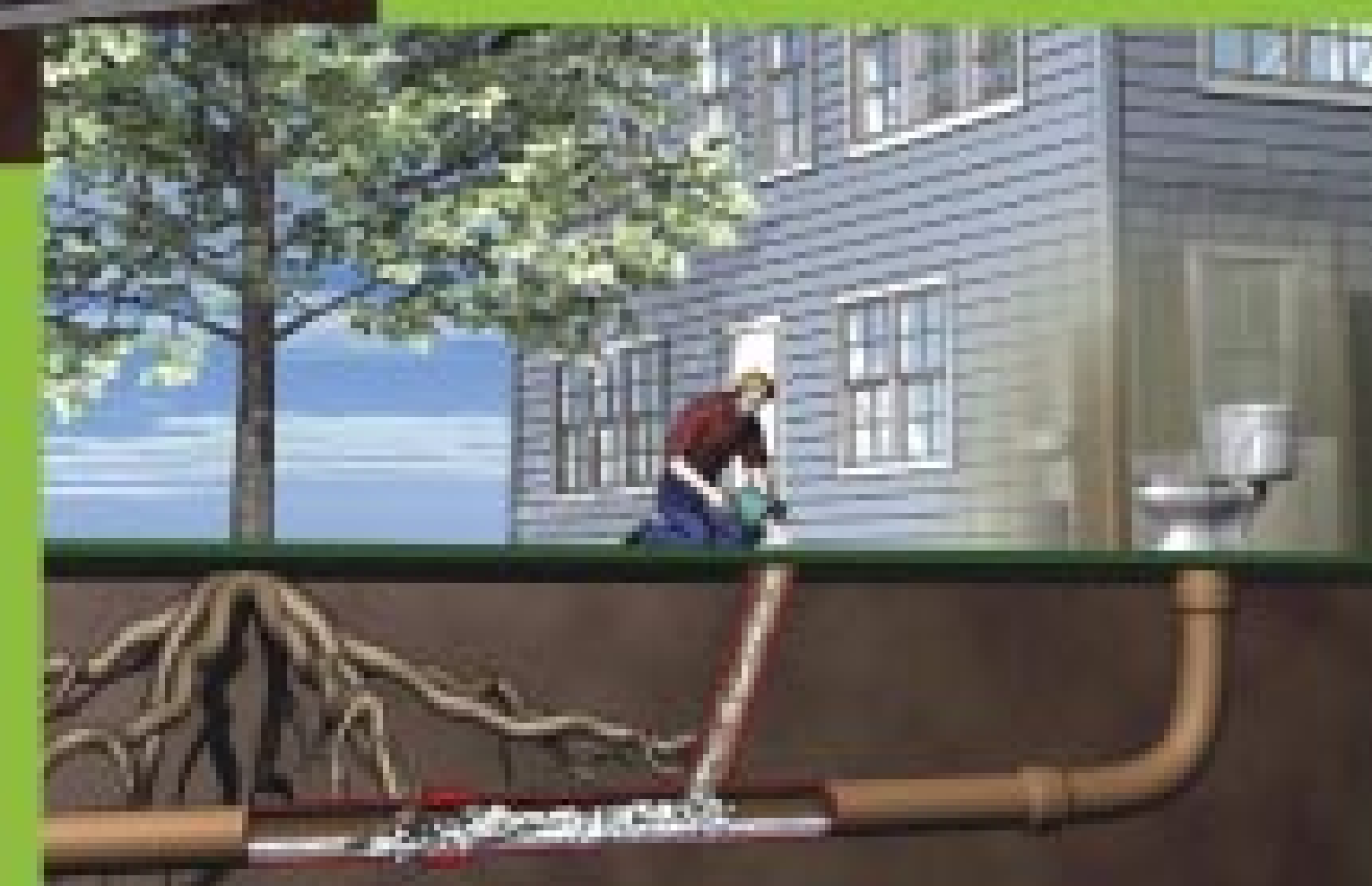
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